JV TASK 99 – INTEGRATED RISK ANALYSIS AND CONTAMINANT REDUCTION, WATFORD CITY, NORTH DAKOTA

Final Report

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ABSTRACT

The Energy & Environmental Research Center (EERC) conducted a limited site investigation and risk analyses for hydrocarbon-contaminated soils and groundwater at a Construction Services, Inc., site in Watford City, North Dakota. Site investigation confirmed the presence of free product and high concentrations of residual gasoline-based contaminants in several wells, the presence of 1,2-dichloroethane, and extremely high levels of electrical conductivity indicative of brine residuals in the tank area south of the facility.

The risk analysis was based on compilation of information from the site-specific geotechnical investigation, including multiphase extraction pilot test, laser induced fluorescence probing, evaluation of contaminant properties, receptor survey, capture zone analysis and evaluation of well head protection area for municipal well field. The project results indicate that the risks associated with contaminant occurrence at the Construction Services, Inc. site are low and, under current conditions, there is no direct or indirect exposure pathway between the contaminated groundwater and soils and potential receptors.

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EXECUTIVE SUMMARY

The Energy & Environmental Research Center (EERC) conducted a limited site investigation and risk analysis for hydrocarbon-contaminated soils and groundwater at a Construction Services, Inc., site in Watford City, North Dakota. Site investigation confirmed the presence of free product and high concentrations of residual gasoline-based contaminants in several wells, the presence of 1,2-dichloroethane, and extremely high levels of electrical conductivity indicative of brine residuals in the tank area south of the facility.

The risk analysis was based on compilation of information from the site-specific geotechnical investigation, including a multiphase extraction pilot test, laser-induced fluorescence probing, evaluation of contaminant properties, a receptor survey, capture zone analysis, and evaluation of well head protection area for the municipal well field. The project results indicate that the risks associated with contaminant occurrence at the Construction Services, Inc., site are low and, under current conditions, there is no direct or indirect exposure pathway between the contaminated groundwater and soils and potential receptors.

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1.0 INTRODUCTION

At the request of the North Dakota Department of Health (NDDH), the Energy & Environmental Research Center (EERC) conducted a limited site investigation and risk analysis. The project primary objective was to integrate recently completed multiphase extraction (MPE) pilot testing (EERC) and a capture zone analysis for the nearby municipal well field (NDDH) into risk analysis for the contaminated area at the Construction Services, Inc., site in Watford City, North Dakota.

The summary of activities presented in this report is as follows:

- Supplemental site investigation including laser-induced fluorescence (LIF) GeoProbe by Dakota Technologies, Inc., conducted November 7–8, 2006.
- Groundwater sampling, water-table monitoring, and hydraulic testing conducted December 5–6, 2006.
- Evaluation of information from the municipal well field, including capture zone analysis and well head protection area.
- Evaluation of remedial technologies/strategies for the subject site.

2.0 SITE CHARACTERISTICS

2.1 Site Location and Contaminant Release History

The original source area is located at 1100 4th Avenue Northeast, T150N R98W Section 18, McKenzie County, Watford City, North Dakota. The current facility, operated by Construction Services, Inc., is a former Chinook Pipeline property. The inferred extent of impacted area is about 100 × 300 ft. The impacted area is in proximity to the municipal well and Cherry Creek. The site layout is provided in Figure 1 and Appendix A.

Following the removal of nine underground storage tanks (USTs) south, west, and north of the former Chinook Pipeline property, the site has undergone monitoring since 1991 [1, 2]. A remedial investigation/feasibility study (RI/FS) was conducted by the EERC in 2005 and included MPE pilot testing and a limited site investigation [3].

2.2 Supplementary Site Investigation and Sediment Properties

An initial site investigation, focusing on the former south tank location was conducted as part of the FS in November 2005 [3]. Supplementary site characterization using GeoProbe and LIF technology was conducted November 7–8, 2006, focusing on the tank areas west and north of the facility. A total of 22 boreholes were advanced to depths of 18–22 ft in order to provide information on contaminant distribution within the sediment profile. Spikes of fluorescence intensity in a wide range of depths between 4 and 16 ft below ground indicate the presence of

LIF-detectable amounts of residual free product in thin layers conducive to product transport and retention. Expanded probing activity to tank areas west and north of the facility did not confirm the presence of free product. Based on probing results and intensity of the LIF response, residual free product is retained in thin discrete layers or lenses of sandy silt and silty sand within the smear zone of fluctuating groundwater. LIF profiles and borehole locations, including data from 2005 LIF activities, are provided in Appendix B.

It is important to note that LIF technology is limited to detection of petroleum hydrocarbons (not chlorinated compounds) in the free phase (not dissolved phase). Further limitations are associated with the tight sedimentary profile such as in clays and clayey silts. Because the extended LIF investigation did not identify contamination in the tank areas west and north of the facility, the proposed expansion of the groundwater-monitoring network was abandoned.

Figure 1. Site plan.

2.3 Geology and Hydrogeology

The sediment profile of the impacted area is dominated by a heterogeneous complex of silty, sandy clays to 8–12 ft that overlay poorly graded silty sands to about 20 ft (terminal depth of wells at the site). Based on geological documentation from a wider area (North Dakota State Water Commission [NDSWC] data and municipal well logs), the clays and lakebed deposits consist of silty clays with highly variable fractions of fine-grained silty sands that extend up to 30–50 ft belowground. These deposits are underlain by the poorly sorted sands and gravels of the Tobacco Garden Creek Aquifer. The top of the aquifer is documented at 34 ft and 51 ft below the surface for municipal wells No. 6 (2750 ft SW) and No. 8 (700 ft SW of the site), respectively.

Depth to water at the site varied from about 10 to 13 ft below ground surface between December 12, 2005, and December 6, 2006 (Appendix C). Groundwater in the shallow intercepted profile is unconfined, with flow direction to the northwest toward Cherry Creek. Groundwater table fluctuation in a relatively shallow aquifer and the attendant thickness of the smear zone reflect the proximity of Cherry Creek, the sewage lift station, and leaking wellheads at older wells.

Groundwater in the Tobacco Garden Creek Aquifer is confined, with a static water table at 7 ft belowground and prevailing groundwater flow direction to the north–northeast. A dynamic water table during intermittent pumping at city well No. 8 is maintained at about 40 ft belowground. The natural water table in the confined Tobacco Garden Creek Aquifer fluctuated over 8 ft between 1991 and 2004 based on NDSWC data from well No. 150-098-18 DDCD west of the site [3, 4].

Groundwater chemistry at the site is dominated by sodium, sulfate, and bicarbonate ions, with high concentrations of iron and electrical conductivity (EC) over 22 mS/cm (wells MW-1, MW-8). Biodegradation parameters indicate limited in situ biodegradation reactions in a reducing environment (Appendix F).

Extremely high concentrations of selected parameters in relatively shallow monitoring wells are not typical for the Tobacco Garden Creek Aquifer pumped for the municipality. High EC and hardness could be associated with a natural discharge pattern. In such a scenario, intensive salt precipitation in upper parts of the sediment profile could be a result of upward flow of sodium and sulfate-rich groundwater, reflecting the confined nature of the underlying aquifer. With respect to unusually high values, however, EC and hardness may be indicative of contamination with brine residuals. Data from NDSWC well No. 150-098-18 DDCD (west of the site and north of the municipal well field) indicate almost a 50% increase in EC and total dissolved solids (TDS) between 1981 and 2000 [3].

3.0 RISK ANALYSIS

3.1 Contaminants of Concern

3.1.1 Selected Properties

The primary contaminants of concern are gasoline-based BTEX (benzene, toluene, ethylbenzene, and xylenes) and 1,2,4-trimethylbenzene. In addition, 1,2-dichloroethane was detected at the site. Its typically industrial use is as a solvent for oils, waxes, and resins; a lead

scavenger in gasoline; and a fumigant. Benzene and 1, 2-dichloroethane are recognized as carcinogens. Selected primary physical properties of contaminants of concern (COCs) are summarized in Table 1.

Table 1. Selected Physical Properties of COCs

	Molecular Weight	Specific Gravity	Solubility mg/l at 20°C	Vapor Pressure at 1 atm (°C)	Absorbability mg/g (at ppb)
Benzene	78	0.88	1780	76 (20)	80 (416)
Toluene	92	0.87	515	22 (20)	50 (317)
Xylenes (3)	106	0.88	540 (25°C)	6 (20)	70 (500)
Ethylbenzene	106	0.87	105	7 (20)	18 (115)
1,2 Dichloroethane	99	1.25	8300 (25°C)	87 (25)	2 (500)

Data compiled from the U.S. Environmental Protection Agency (EPA) [5]; Merck Index, 1996 [6]; Suthersan, 2002 [7]; Nyer, 2001 [8]; and Montgomery and Welcom, 1990 [9].

3.1.2 Potential Health Effects

3.1.2.1 Benzene

Short-term: Benzene has the potential to cause the following health effects when people are exposed to it at levels above the maximum contaminant level (MCL) for relatively short periods of time: temporary nervous system disorders, immune system depression, and anemia.

Long-term: Benzene has the potential to cause the following effects from a lifetime exposure at levels above the MCL: chromosome aberrations and cancer.

3.1.2.2 1,2-Dichloroethane

Short-term: 1,2-dichloroethane has the potential to cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: central nervous system disorders, and adverse lung, kidney, liver, circulatory, and gastrointestinal effects.

Long-term: 1,2-dichloroethane has the potential to cause the following effects from a lifetime exposure at levels above the MCL: cancer.

3.1.2.3 Ethylbenzene

Short-term: Ethylbenzene has the potential to cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: drowsiness, fatigue, headache, and mild eye and respiratory irritation.

Long-term: Ethylbenzene has the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to the liver, kidneys, central nervous system, and eyes.

3.1.2.4 Toluene

Short-term: Toluene has the potential to cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: minor nervous system disorders such as fatigue, nausea, weakness, and confusion.

Long-term: Toluene has the potential to cause the following effects from a lifetime exposure at levels above the MCL: more pronounced nervous disorders such as spasms, tremors, impairment of speech, hearing, vision, memory, coordination; and liver and kidney damage.

3.1.2.5 Xylenes

Short-term: Xylenes have the potential to cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: disturbances of cognitive abilities, balance, and coordination.

Long-term: Xylenes have the potential to cause the following effects from a lifetime exposure at levels above the MCL: damage to the central nervous system, liver, and kidneys.

3.2 Soil Contamination

Soil samples collected during monitoring well installation on October 19–20, 2005, represent composites based on photoionization detector (PID) readings [3]. Concentrations exceeding North Dakota action levels in soils of 100 and 0.5 mg/kg for total petroleum hydrocarbons (TPH) and benzene, respectively, were found in all new boreholes located in the south UST area. Maximum values in excess of 4100 mg/kg for TPH and 39 mg/kg for benzene indicate the persistent presence of free product within the smear and unsaturated zones (Table 2).

Table 2. BTEX in Soils

		REC-1	MW-11	MW-12	MW-13	MW-13
Date Sampled		11/20/05	11/19/05	11/19/05	11/20/05	11/20/05
Interval (ft)		11-13	11-13	11-13	7-9	10-12
MTBE[1]	µg/kg	<50	<13.1	<100	<5000	<250
Benzene	µg/kg	1174	1186	917.1	39,260	6743
Toluene	µg/kg	349	113.2	183.7	184,200	711.5
Ethylbenzene	µg/kg	484	331.9	1372	83,640	6030
Xylenes (Total)	µg/kg	1280	361	1573	337,400	13,310
TPH (GRO[2])	mg/kg	24	13	77	4,100	250

[1] Methyl *tertiary*-butyl ether.
[2] Gasoline-range organics.

3.3 Groundwater Contamination

A total of ten groundwater samples, including a sample from municipal well No. 8, and one surface water sample (Cherry Creek) were analyzed for the full suite of volatile organic contaminants (VOCs) using method SW 8021 (465F) (Table 3, Appendix F and G). In addition,

biodegradation indicators were analyzed in all samples (Appendix F and G-2). Samples were collected using disposable PVC bailers, preserved on-site, and stored on ice. Samples for dissolved metals were filtered using 0.45-µm Geotech disposable filters. All analyses were conducted by MVTL in Bismarck, North Dakota, and New Ulm, Minnesota. Quality assurance/quality control (QA/QC) samples totaled one field blank, one trip blank, one equipment blank, and a duplicate. Field-measured parameters including temperature, dissolved oxygen (DO), EC, pH, and ox-redox potential were recorded during sampling. Table 3 and Appendix A provide a summary of analytical results for targeted compounds; complete analytical documentation is in Appendix G. In addition to EERC sampling, COC trends and previous analysis were evaluated based on results of the MPE pilot test [3] and documentation provided by NDDH.

Table 3. COC Concentrations in Groundwater (analyses – December 6, 2006)

Well ID	Benzene µg/l	Toluene µg/l	Ethylbenzene µg/l	Xylenes (total) µg/l	GRO (TPH) mg/l	DCA[1] µg/l	TMB[2] µg/l
MW-1	<0.5	<0.6	<0.6	<3	<0.2	<0.5	<0.7
MW-5	<0.5	<0.6	<0.6	<3	<0.2	<0.5	<0.7
MW-6	39.9	<0.6	7.1	4.4	<0.2	1.6	<0.7
MW-8	<0.5	<0.6	<0.6	<3	<0.2	<0.5	<0.7
MW-9	<0.5	<0.6	<0.6	<3	<0.2	<0.5	<0.7
MW-11	18790	1008	2125	2534	53.7	2466	1232
MW-13	29370	4430	3814	9538	112.7	1828	1674
REC-1	17800	862.9	3206	4054	65.63	2095	1316
Cherry Cr.	<0.5	<0.6	<0.6	<3	<0.2	<0.5	<0.7
City Well 8	<0.5	<0.6	<0.6	<3	<0.2	<0.5	<0.7
EPA MCL	***5***	***1000***	***700***	***10000***	***0.5***	***5***	
NDDH[3]	***5***	***5***	***5***	***5***			

[1] 1,2 dichloroethane.
[2] 1,2,4-trimethylbenzene.
[3] NDDH action levels.

Free product was detected in MW-4 (0.2 ft) and MW-12 (0.1 ft). Concentrations of target contaminants considerably exceed EPA MCL regulatory levels and North Dakota action levels for benzene in monitoring wells MW-6, 11, 13 and recovery well REC-1 (Table 3). In addition, the presence of 1,2,4-trimethylbenzene (of gasoline origin) and the 1,2-dichloroethane as high as 2466 µg/l was detected at the site.

3.4 Hydraulic Properties and Contaminant Transport

Hydraulic testing was conducted in December 2006 and as an integral part of the MPE pilot test in April 2006. A slug test was conducted on well REC-1 to evaluate hydraulic parameters. Interpretation of the hydraulic test is summarized in Appendix D. The slug consisted of a 3-inch-diameter PVC pipe which was filled with sand and sealed at both ends. The volume displaced by the slug was 1.0 gallon (3.785 L). Aquifer response was recorded using a Telog® PR-31 data collection system, with standard manual water level (water level indicator) collection for confirmation.

Hydraulic conductivity was 6×10^{-5} ft/min (3×10^{-7} m/s) using the Bower-Rice method and 9×10^{-5} ft/min (5×10^{-7} m/s) using the Hvorslev algorithm for slug test. Extremely low values of hydraulic conductivity and high vacuum required to overcome formation resistance to hydraulic and pneumatic flow, including low yield (0.07-0.3 gpm) documented from the MPE pilot test, indicate extremely low potential for off-site contaminant transport.

The calculated values are representative of horizontal hydraulic conductivity. Reflecting on heterogeneous site geology and considerable presence of a clayey fraction in the upper portion of the sediment profile, the vertical conductivity is typically several orders of magnitude smaller. In order to account for the worst-case scenario and dual porosity (matrix versus preferential flow), an aquifer saturated thickness of 0.5–1.5 ft was used for interpretation to account for expected preferential flow in more permeable layers/lenses. The difference of about 10% in calculated values for hydraulic conductivity was negligible. An additional factor contributing to reduction of COC migration downgradient is the confined nature of the underlying aquifer, with gradient toward the surface.

The contaminated area lies close to the wellhead protection area for the northern municipal well field (Appendix E) but not in the capture zone. With respect to the results of this project, construction of the municipal well, and the results of detailed capture zone analysis, including well head delineation conducted by NDDH [10], the potential for contaminant migration to the municipal well field is extremely limited.

3.5 Municipal Well – Capture Zone Analysis

Detailed analysis of the capture zone and well head protection area (WHPA) for the municipal well field was completed by NDDH in 2006 [10]. The WHPA delineation presented in Appendix E is based on the zone of contribution method using a modular, semianalytical groundwater flow model developed by EPA. The current WHPA was delineated using hydraulic properties of the Tobacco Garden Creek Aquifer and is based on a 10-year time of travel under constant pumping condition. In the absence of site-specific hydraulic information and limited capabilities of the EPA model, the selected approach represents a reasonably conservative scenario. With respect to extreme heterogeneity and random occurrence of preferential flow pathways (layers, lenses) in sediments overlying the Tobacco Garden Creek Aquifer, the uncertainties associated with definition of leakage and transport parameters would outweigh the benefits and reliability of the numerical modeling. The primary factors supporting adequate aquifer protection as defined by the current WHPA are as follows:

- Hydraulic conductivity of the Tobacco Garden Creek Aquifer (150-200 ft/day) is several orders of magnitude higher that those for overlying sediments (0.1 ft/day).

- The Tobacco Garden Creek Aquifer is confined, with a static water table at about 7 ft below the surface at well No. 8 [10]. The water table at the site is at 10–13 ft belowground.

- Groundwater flow direction in the deeper, Tobacco Garden Creek Aquifer, is to the north, north–east–north, i.e., COC-impacted site is downgradient from municipal wells.

- The model is using a 10-year time of travel under constant pumping conditions. Actual aquifer usage is based on a demand-driven intermittent pumping.

3.6 Exposure Factors

The primary exposure factors were evaluated in accordance with ASTM International's Standard Guide for Risk-Based Corrective Action [11]. The exposure assessment is based on evaluation of the magnitude, frequency, duration, and route of exposure between a source area and a receptor.

3.6.1 Exposure Pathways

The contaminated soil and groundwater is several feet below the ground surface. Unless disturbed (excavation), there is no identifiable direct exposure pathway at the source. The only realistic exposure pathway is indirect via exposure to contaminated groundwater after its migration off-site. With respect to site-specific geotechnical conditions described in detail in previous sections, the COC off-site migration and its leakage to the underlying confined aquifer is extremely limited, with the potentially impacted area outside the zone of groundwater use. In addition, the hydraulic factors (gradient, flow direction, confined nature) and construction of the municipal well further limits potential for COC to enter the water supply chain. The municipal well No. 8 closest to the site (~700 ft), intercepts the source aquifer at 51 ft. The well is cased with stainless steel to 78 ft, grouted to 60 ft, and screened from 78–108 ft.

3.6.2 Exposure Routes

In the absence of a direct exposure pathway and the low probability of an indirect exposure pathway, water intake by ingestion is the only realistic scenario for the exposure route. Providing the site is excavated (corrective action, construction, etc.), additional exposure routes would be inhalation of VOCs and dermal contact with contaminated soil.

3.6.3 Receptors

The site is located in an industrial zone. Occupational hazards are minimal because of intercepted exposure pathways (below the surface location of impacted soils and groundwater) and open field area. In case of excavation of contaminated soils, a short-term exposure to volatile contaminants would have to be addressed by proper material handling and appropriate personal protective equipment. With respect to high vapor pressure (high volatilization rates for primary carcinogens), the potential exposure would be short term. There is no residential exposure or receptors at or downgradient from the impacted area.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The risk analysis presented is based on compilation of information from the site-specific geotechnical investigation, evaluation of contaminant properties, a receptor survey, capture zone analysis, and evaluation of the wellhead protection area for the municipal well field. The project results indicate that the risks associated with contaminant occurrence at the Construction Services, Inc., site are low and, under current conditions, there is no direct or indirect exposure pathway between the contaminated groundwater and soils and potential receptors.

The results of the investigation and primary factors contributing to risk reduction are as follows:

- Expanded probing activity to tank areas west and north of the facility did not confirm the presence of the free product. The area of impacted soil and groundwater is limited to the tank area southwest of the facility.

- Based on the geological profile and results the LIF and hydraulic testing, residual free product is retained in thin discrete layers or lenses of sandy silt and silty sand within the smear zone of fluctuating groundwater.

- Low values of hydraulic conductivity, high formation resistance to hydraulic and pneumatic flow, and low yield indicate extremely low potential for off-site contaminant transport.

- The hydraulic conductivity of the underlying Tobacco Garden Creek Aquifer is several orders of magnitude higher than that for overlying sediments. In combination with confined aquifer conditions, it minimizes potential for vertical migration to deeper water-bearing sediments.

- Groundwater flow direction in the deeper Tobacco Garden Creek Aquifer is to the north, north–east–north, i.e., the COC-impacted site is downgradient from municipal wells.

- The impacted area does not lie in the capture zone for the municipal well field and is outside of the well head protection area as defined by NDDH.

- There is no direct exposure pathway between the contaminant source and the potential receptor at this time.

- There is no residential exposure or receptors at or downgradient from the impacted area.

It is important to note that site-specific conditions and risk-limiting factors never completely eliminate the risks associated with contaminant occurrence. The site-specific geotechnical conditions considerably limit options for remedial alternatives. The MPE pilot test confirmed the applicability of vacuum enhancement; however, the technology would have to be modified to overcome limitations associated with tight geology and would be more expensive than excavation. In the case where risk elimination is required, the excavation of the impacted area and replacement with inert, well-compacted soil is identified as the economically most feasible option.

Based on the results of the risk analysis presented, it is recommended to:

- Seal and abandon all wells at the site with the exception of wells MW-5, MW-8, and MW-9.

- Initiate biannual water quality monitoring in wells MW-5, MW-8, and MW-9 for target COC, namely BTEX and 1,2 dichloroethane.

- Periodically sample municipal well No. 8 with analyses for BTEX and 1,2-dichloroethane.

5.0 REFERENCES

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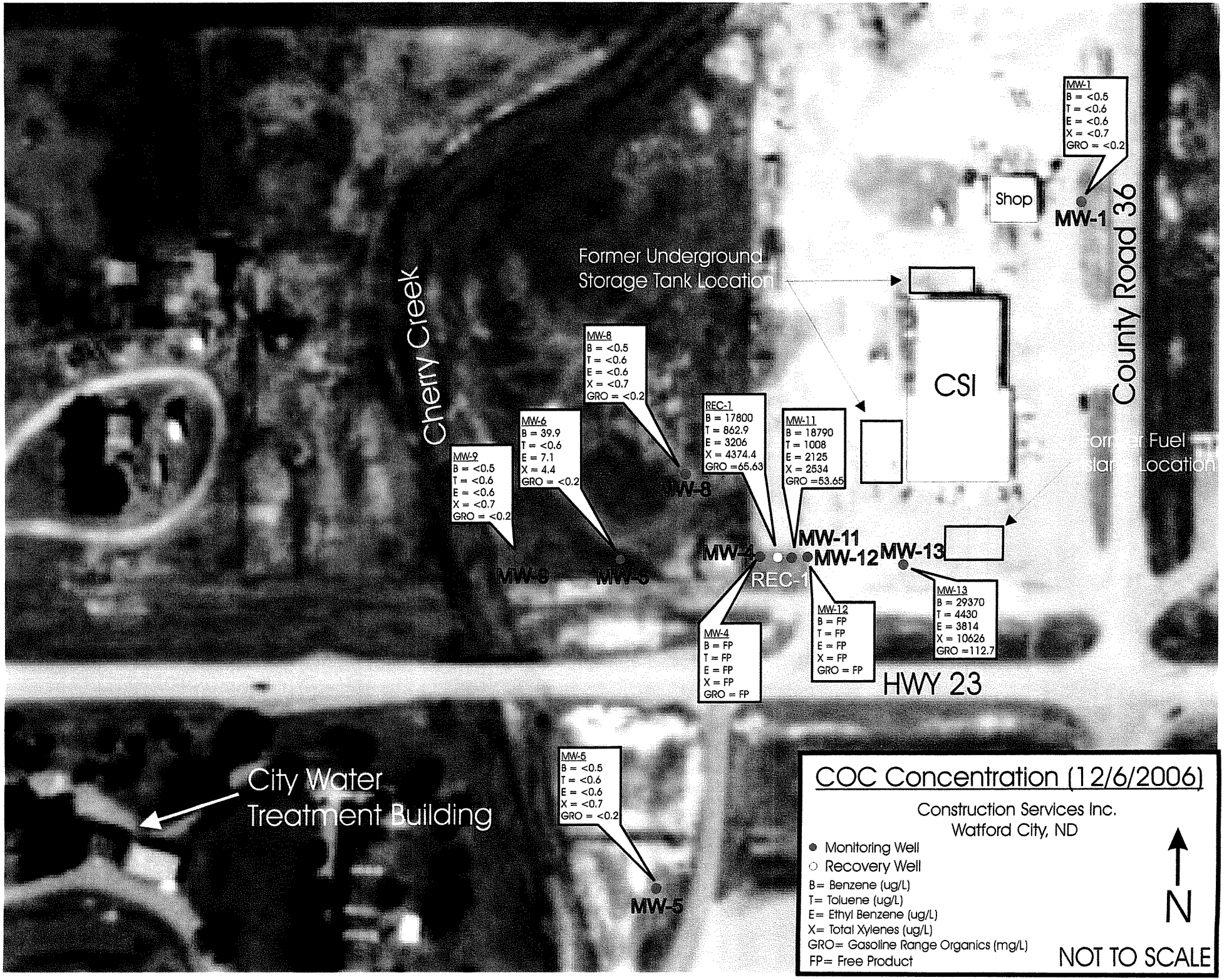
APPENDIX A

SITE PLAN


MW-1
B = <0.5
T = <0.6
E = <0.6
X = <0.7
GRO = <0.2
Shop
MW-1
County Road 36
Former Underground
Storage Tank Location
Cherry Creek
MW-8
B = <0.5
T = <0.6
E = <0.6
X = <0.7
GRO = <0.2
REC-1
B = 17800
T = 862.9
E = 3206
X = 4374.4
GRO =65.63
MW-11
B = 18790
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E = 2125
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GRO =53.65
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MW-6
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MW-9
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E = <0.6
X = <0.7
GRO = <0.2
MW-8
MW-9
MW-6
MW-4
REC-1
MW-11
MW-12
MW-13
MW-4
B = FP
T = FP
E = FP
X = FP
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MW-12
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T = FP
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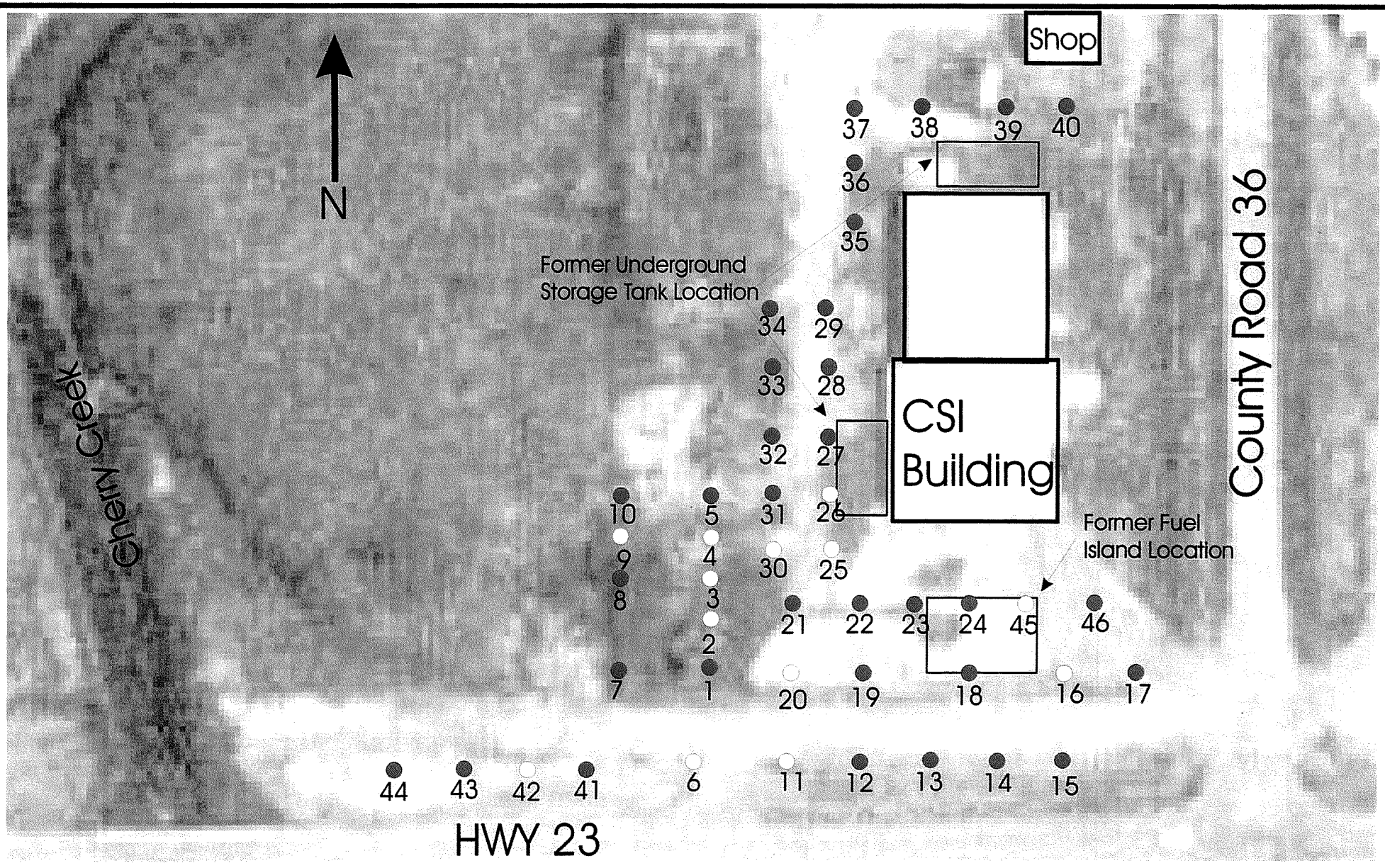
GRO = FP
MW-13
B = 29370
T = 4430
E = 3814
X = 10626
GRO =112.7
HWY 23
City Water
Treatment Building
MW-5
B = <0.5
T = <0.6
E = <0.6
X = <0.7
GRO = <0.2
MW-5
COC Concentration (12/6/2006)
Construction Services Inc.
Watford City, ND
Monitoring Well
Recovery Well
B= Benzene (ug/L)
T= Toluene (ug/L)
E= Ethyl Benzene (ug/L)
X= Total Xylenes (ug/L)
GRO= Gasoline Range Organics (mg/L)
FP= Free Product
N
NOT TO SCALE

APPENDIX B

LIF DOCUMENTATION



DATE: 1/23/2007

DRAWN BY: BWB

● Non-Contaminated Probe

○ Contaminated Probe

LIF LOCATION MAP

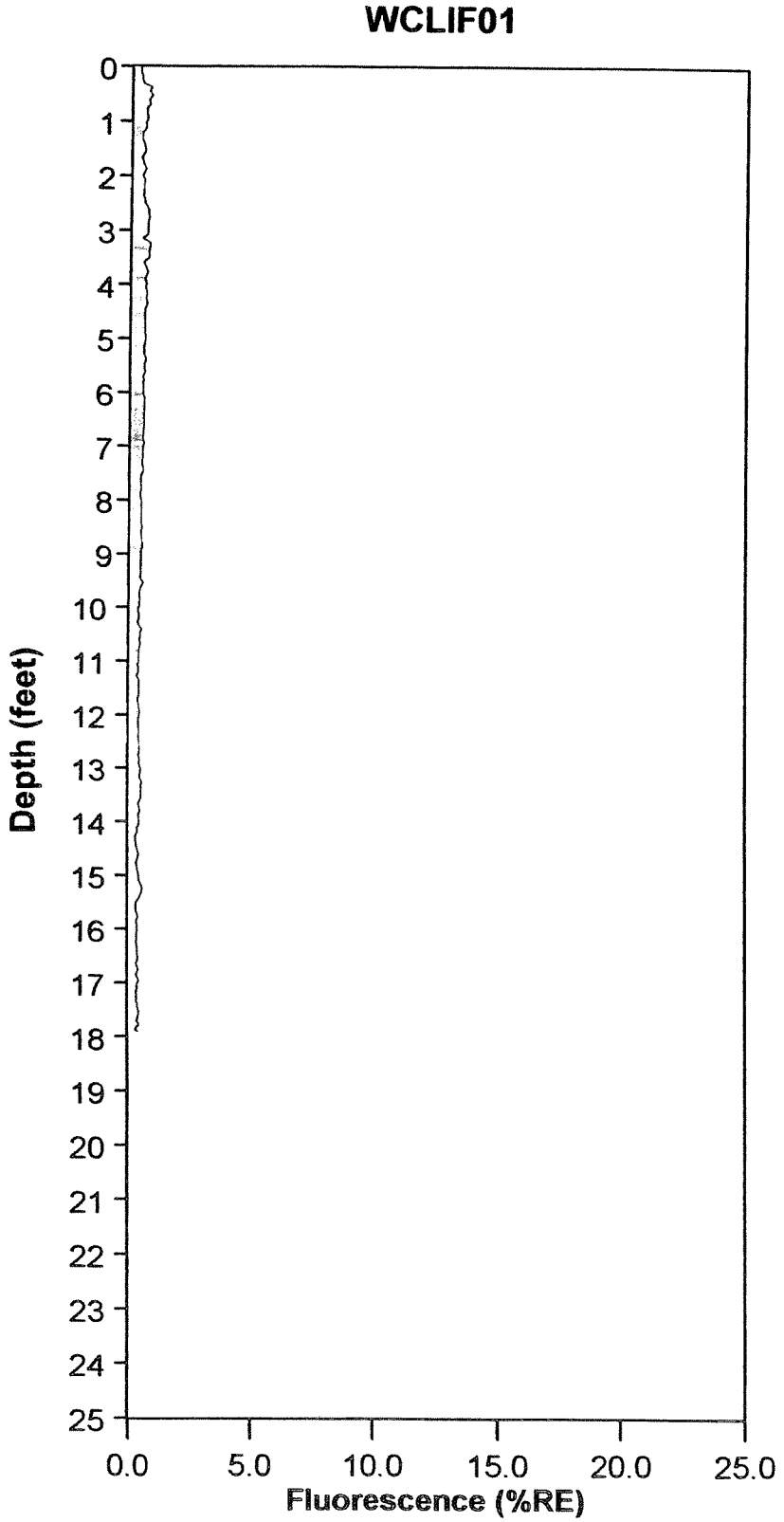
CSI

Watford City, NORTH DAKOTA

*Not to Scale

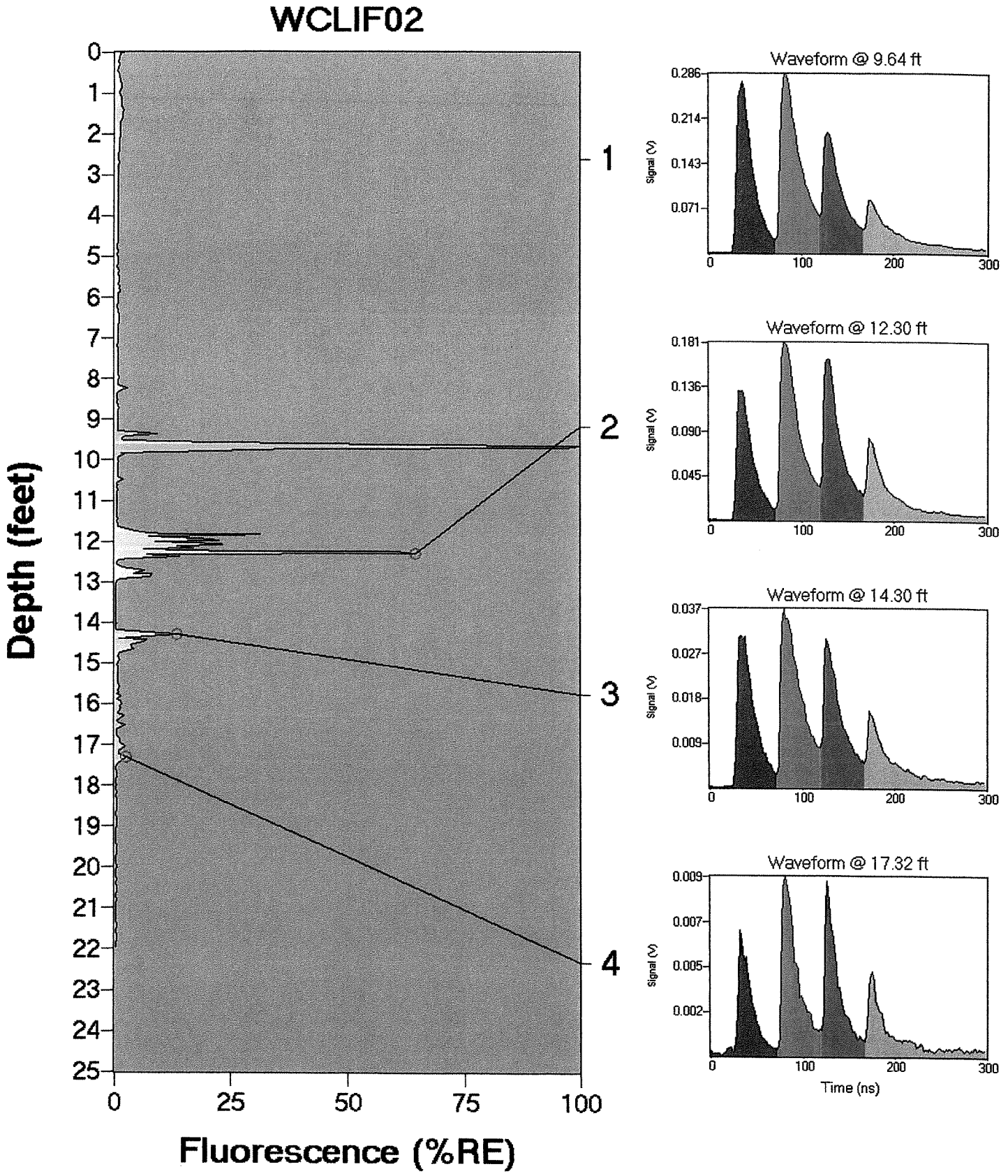
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/9/2005 @ 4:01:36 PM	Max fluorescence: 0.81% @ 0.52 ft
ROST Unit: DTI-01	Final depth BGS: 17.89 ft



ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/9/2005 @ 4:24:24 PM	Max fluorescence: 100.58% @ 9.64 ft
ROST Unit: DTI-01	Final depth BGS: 22.00 ft



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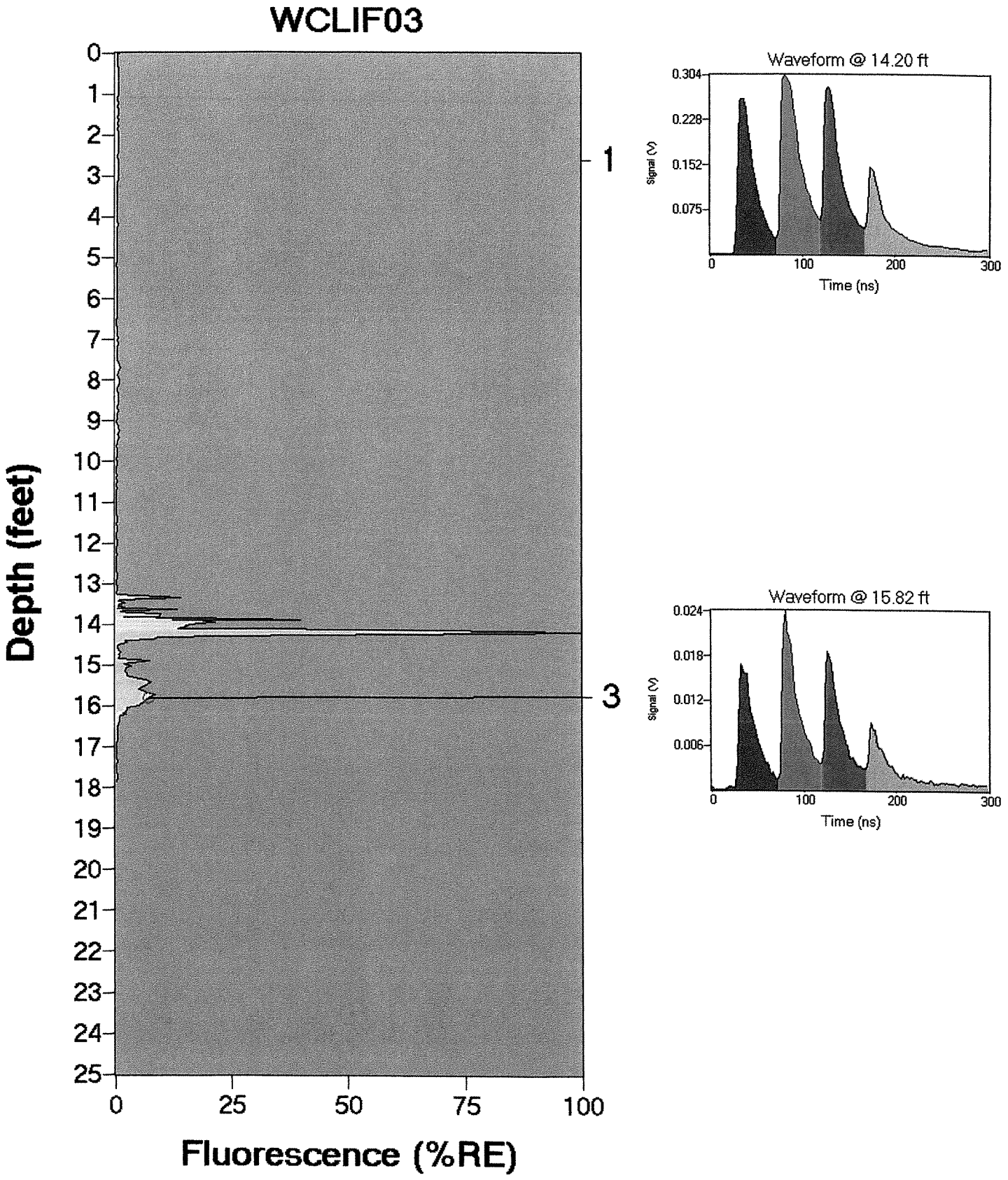
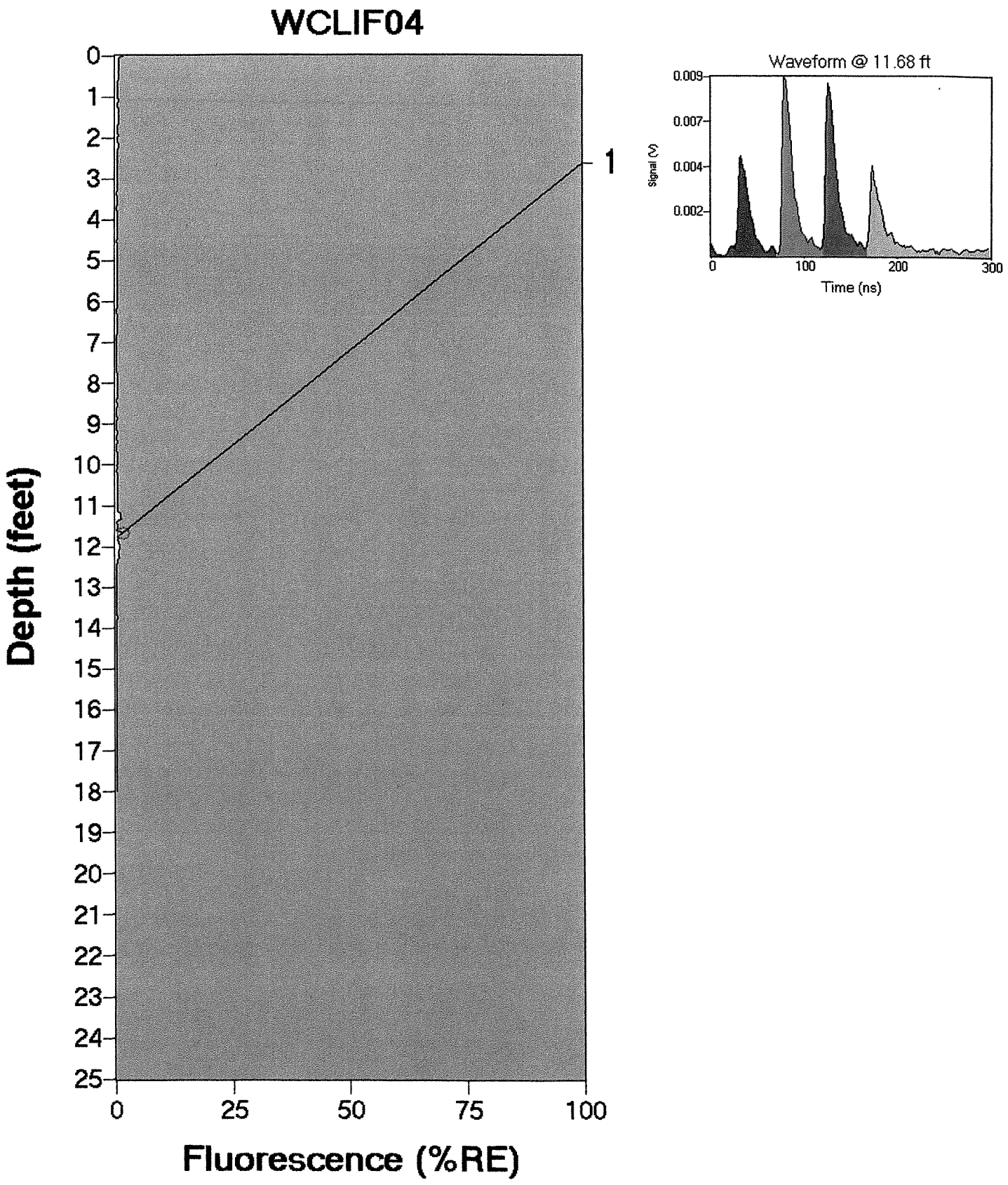
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/9/2005 @ 4:47:06 PM	Max fluorescence: 120.75% @ 14.20 ft
ROST Unit: DTI-01	Final depth BGS: 17.90 ft



ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/9/2005 @ 5:06:01 PM	Max fluorescence: 1.82% @ 11.68 ft
ROST Unit: DTI-01	Final depth BGS: 18.02 ft



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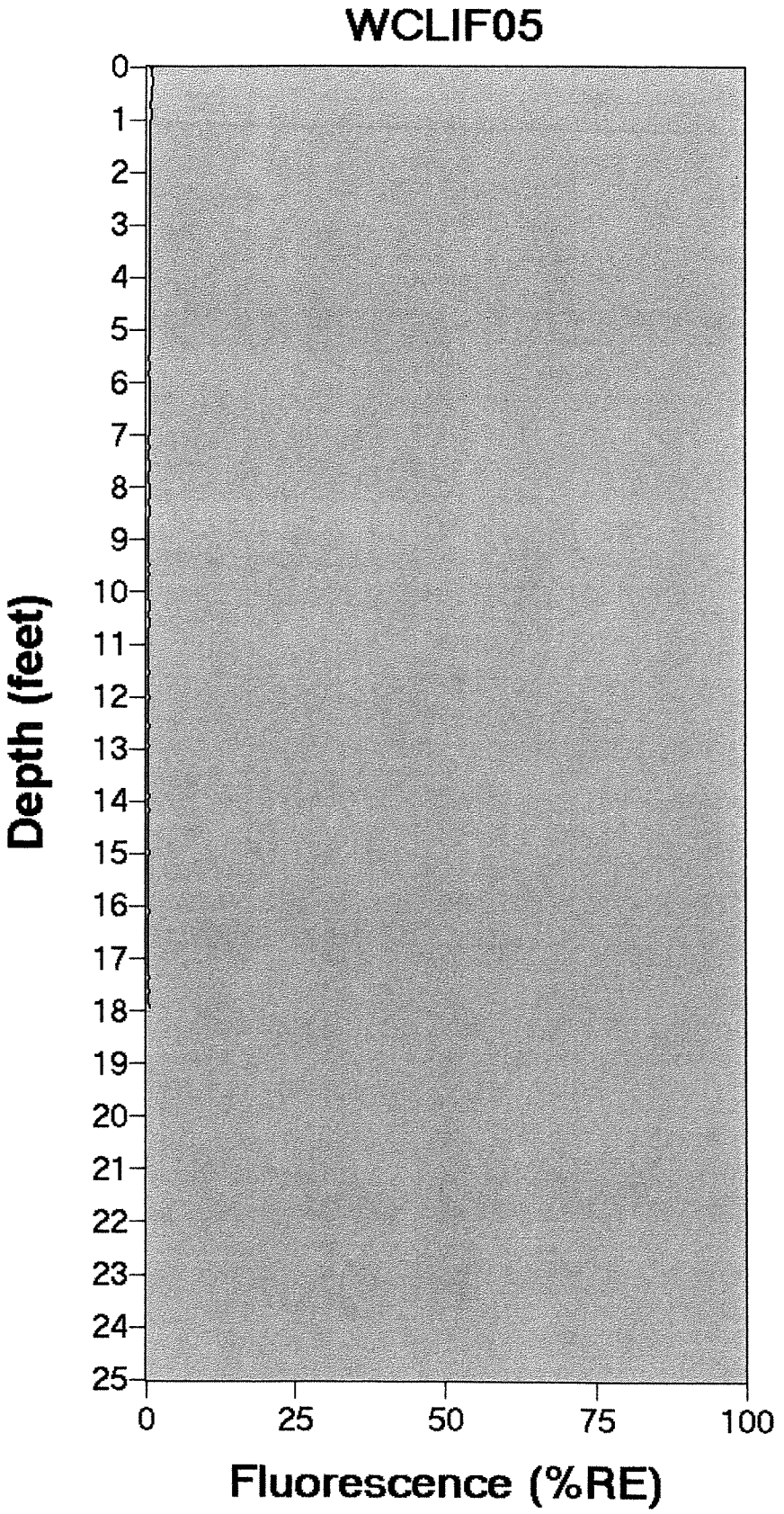
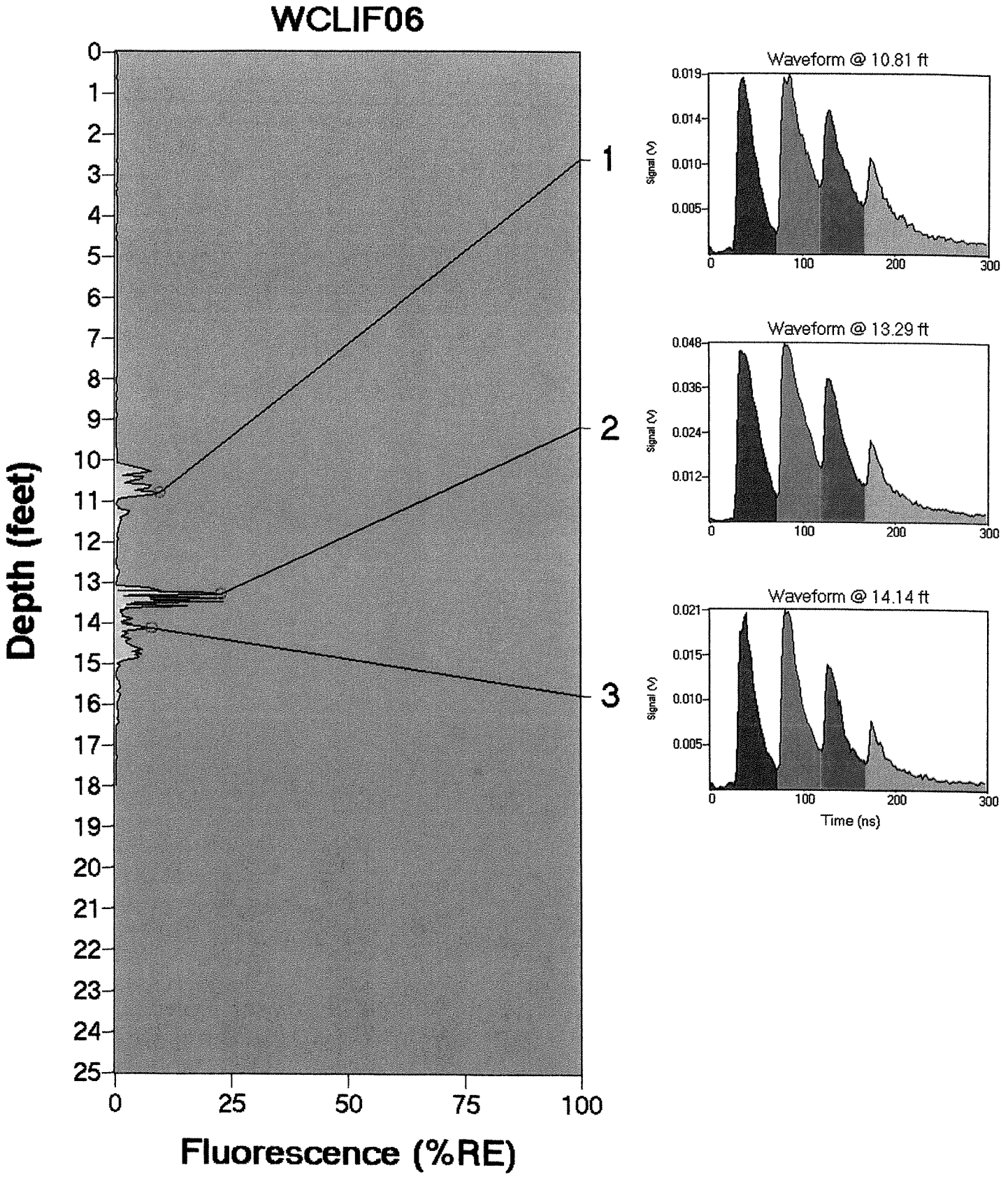
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/9/2005 @ 5:21:42 PM	Max fluorescence: 1.01% @ 0.22 ft
ROST Unit: DTI-01	Final depth BGS: 17.98 ft



ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/9/2005 @ 5:37:50 PM	Max fluorescence: 23.49% @ 13.39 ft
ROST Unit: DTI-01	Final depth BGS: 18.02 ft



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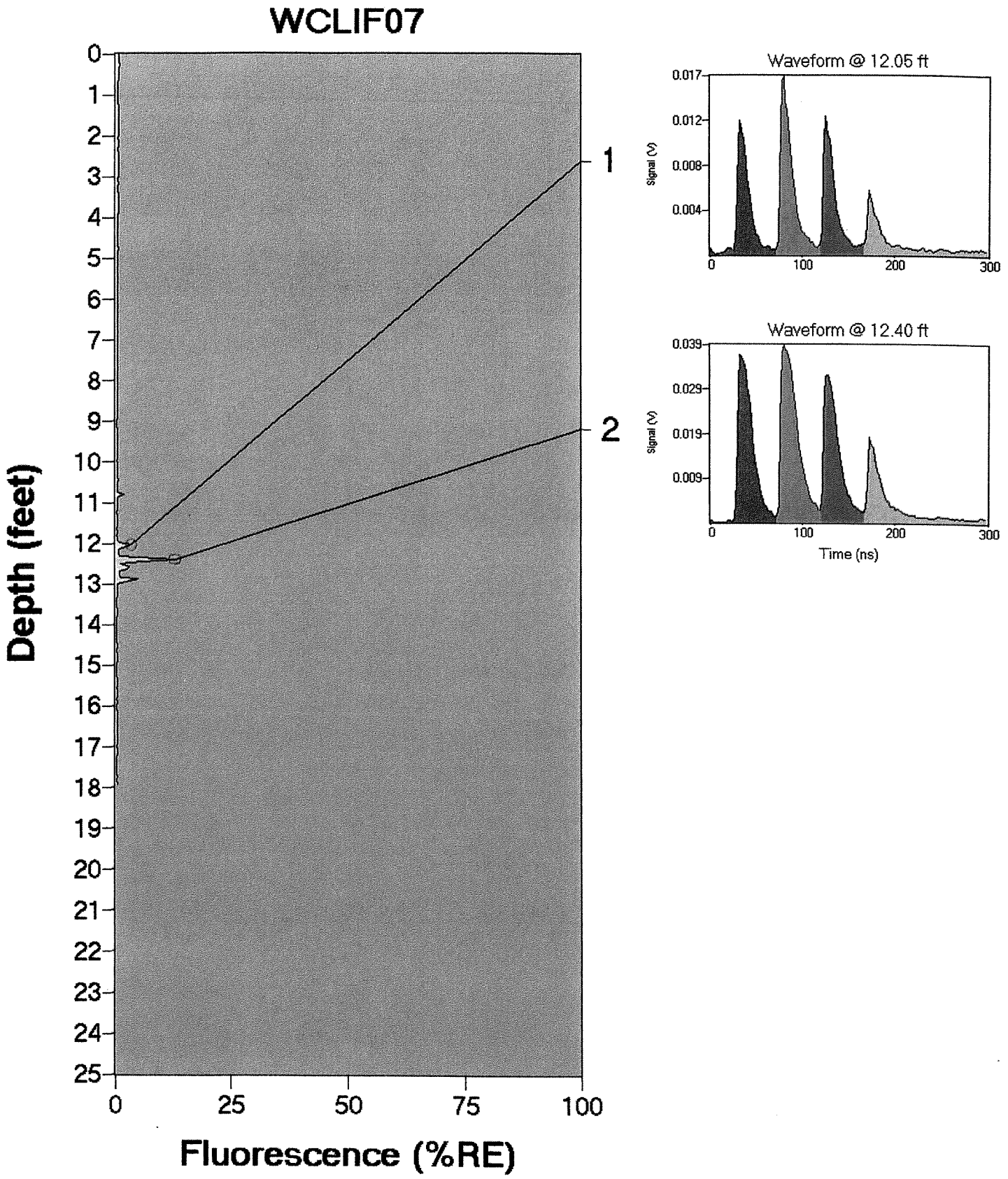
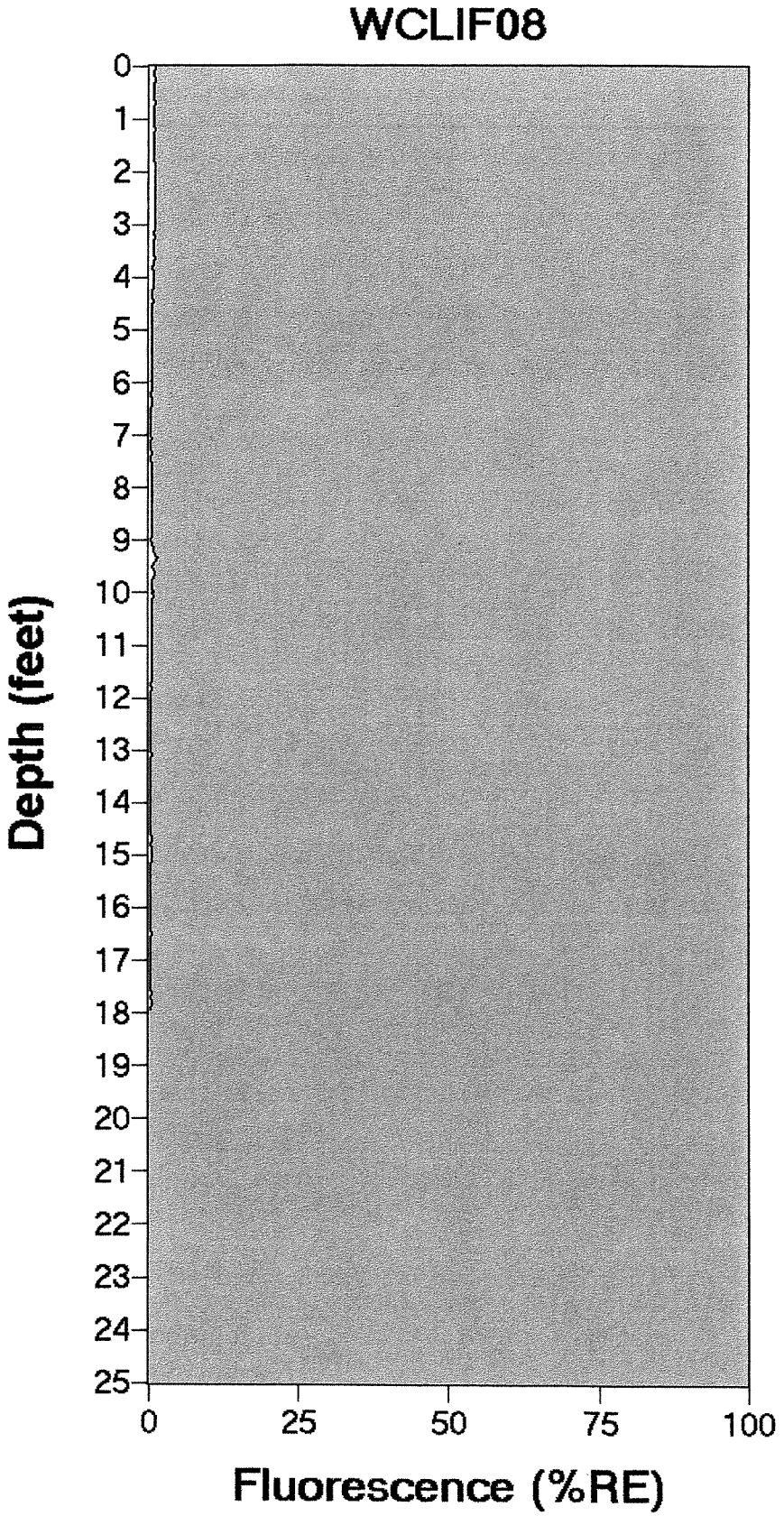
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/9/2005 @ 5:55:58 PM	Max fluorescence: 13.03% @ 12.40 ft
ROST Unit: DTI-01	Final depth BGS: 17.93 ft



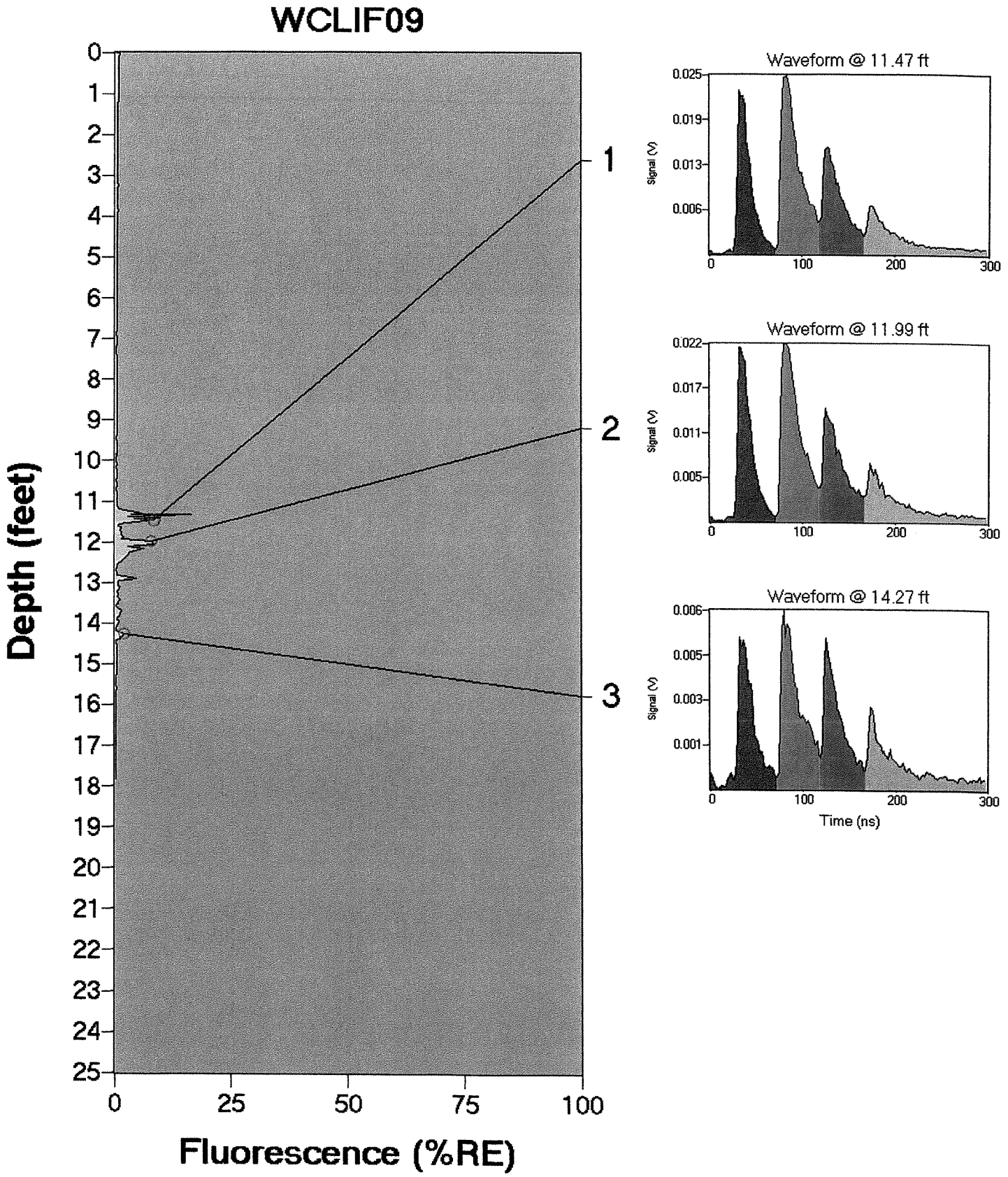
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/9/2005 @ 6:12:22 PM	Max fluorescence: 1.43% @ 9.33 ft
ROST Unit: DTI-01	Final depth BGS: 17.97 ft



ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/9/2005 @ 6:34:14 PM	Max fluorescence: 16.46% @ 11.34 ft
ROST Unit: DTI-01	Final depth BGS: 17.87 ft



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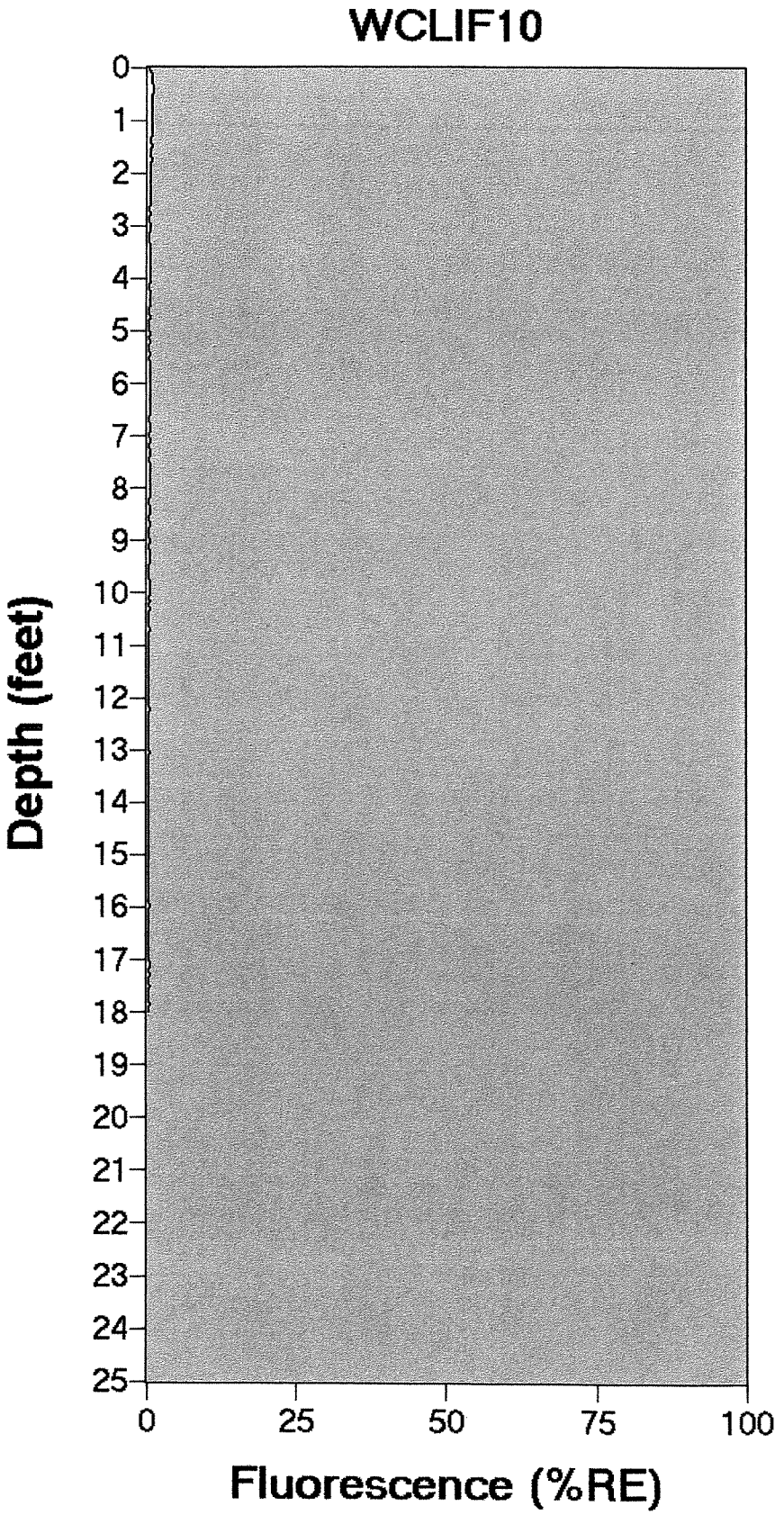
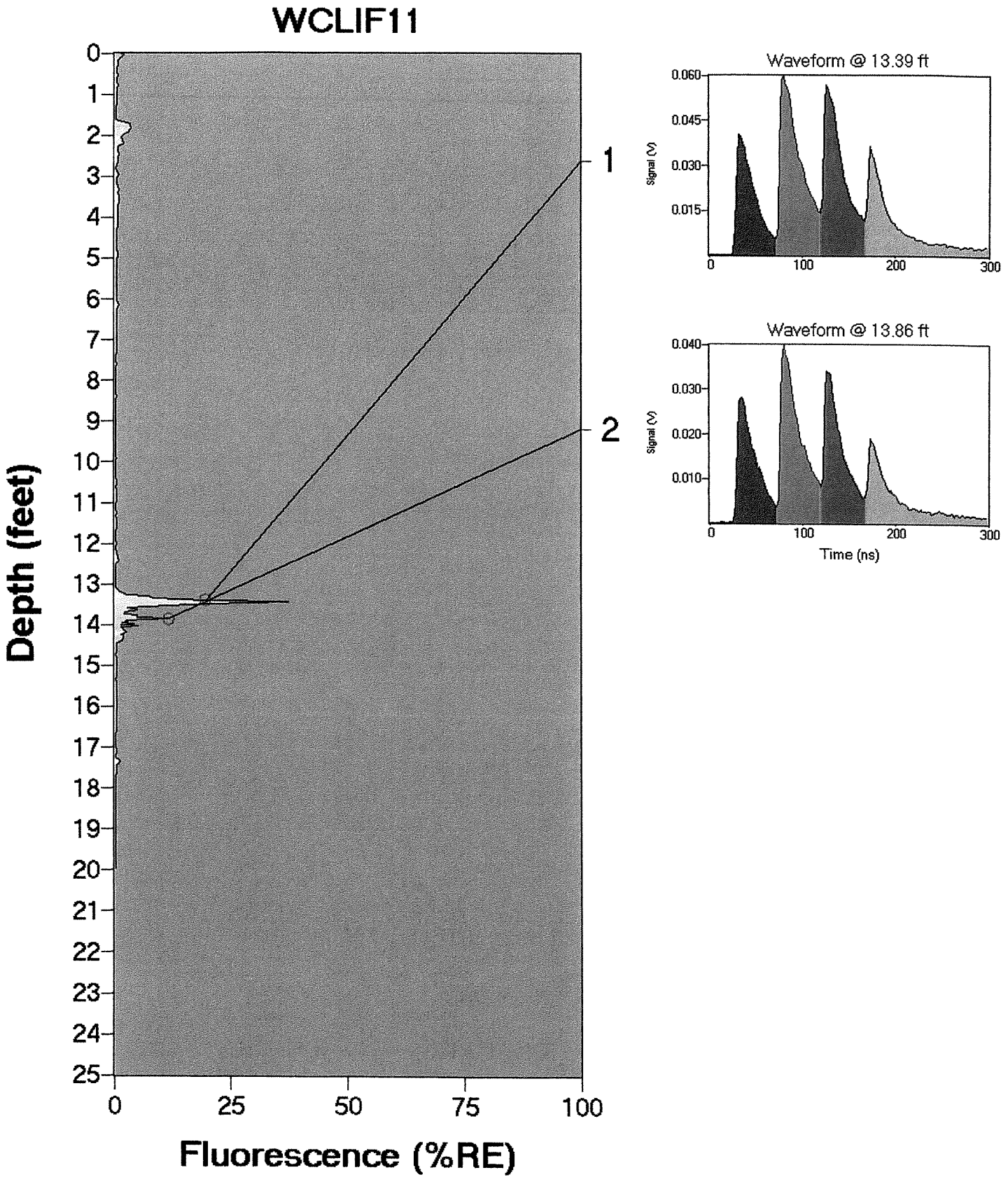
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 8:26:02 AM	Max fluorescence: 0.96% @ 0.45 ft
ROST Unit: DTI-01	Final depth BGS: 18.02 ft



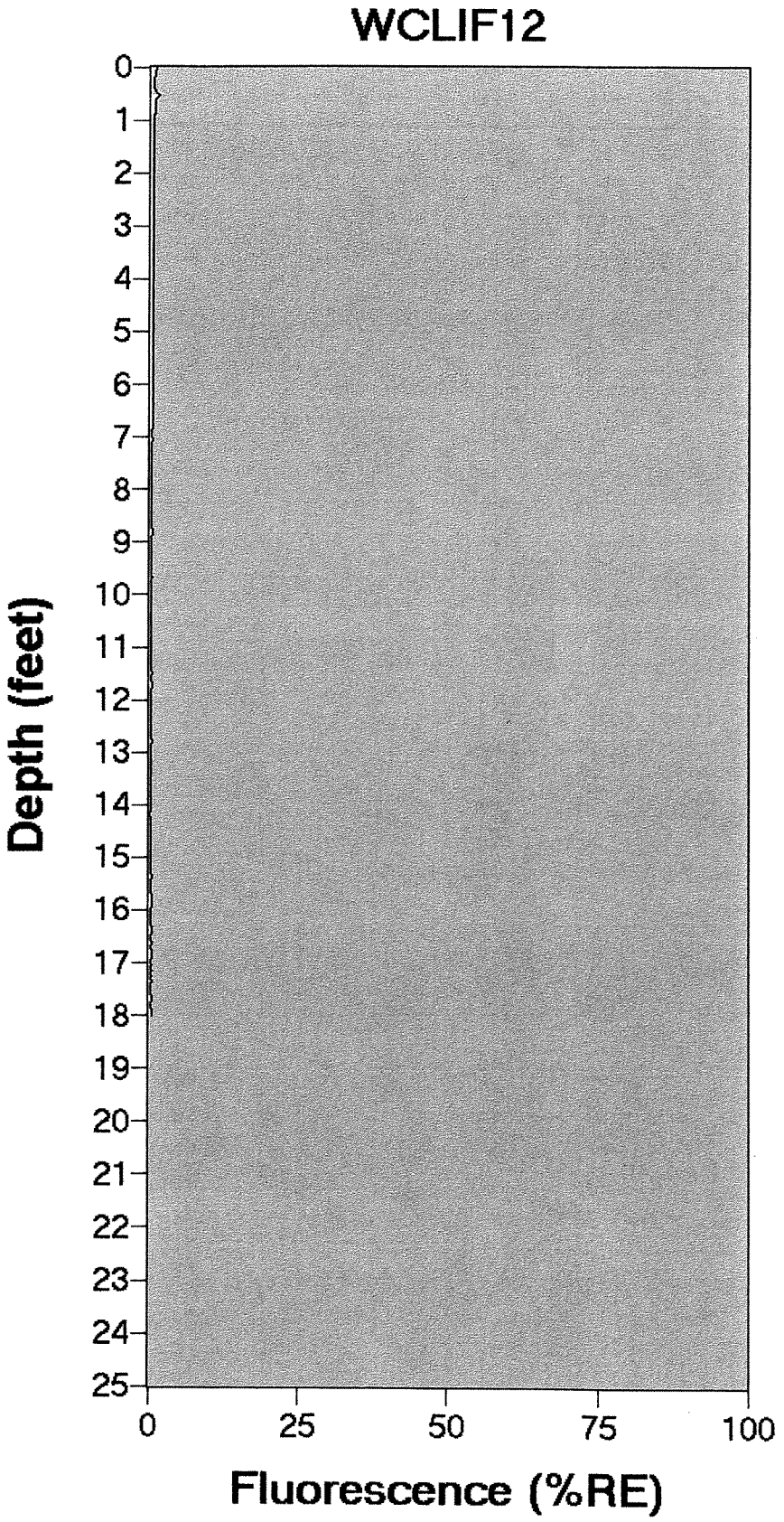
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 8:47:32 AM	Max fluorescence: 37.33% @ 13.44 ft
ROST Unit: DTI-01	Final depth BGS: 20.00 ft



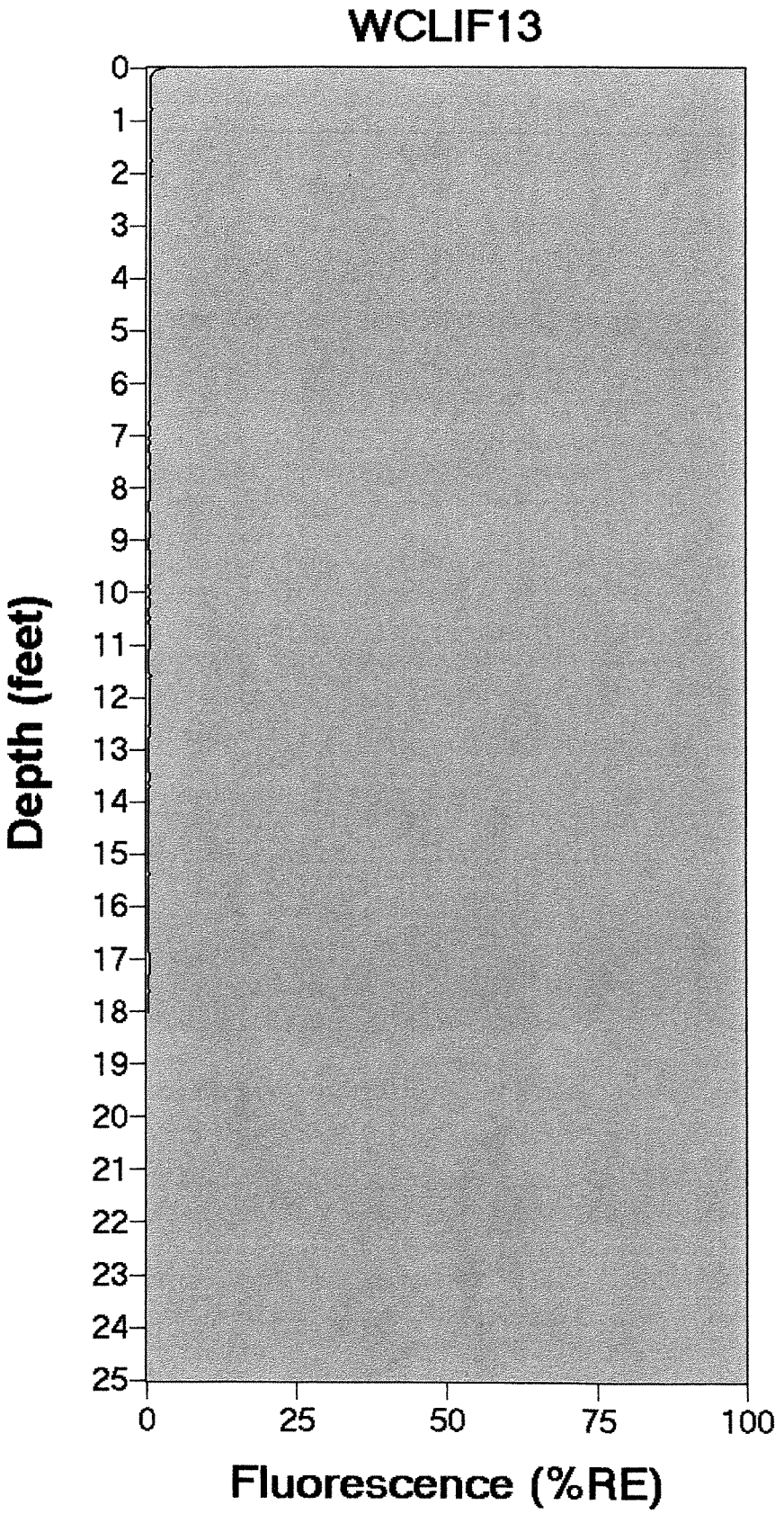
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 9:11:43 AM	Max fluorescence: 1.38% @ 0.54 ft
ROST Unit: DTI-01	Final depth BGS: 18.00 ft



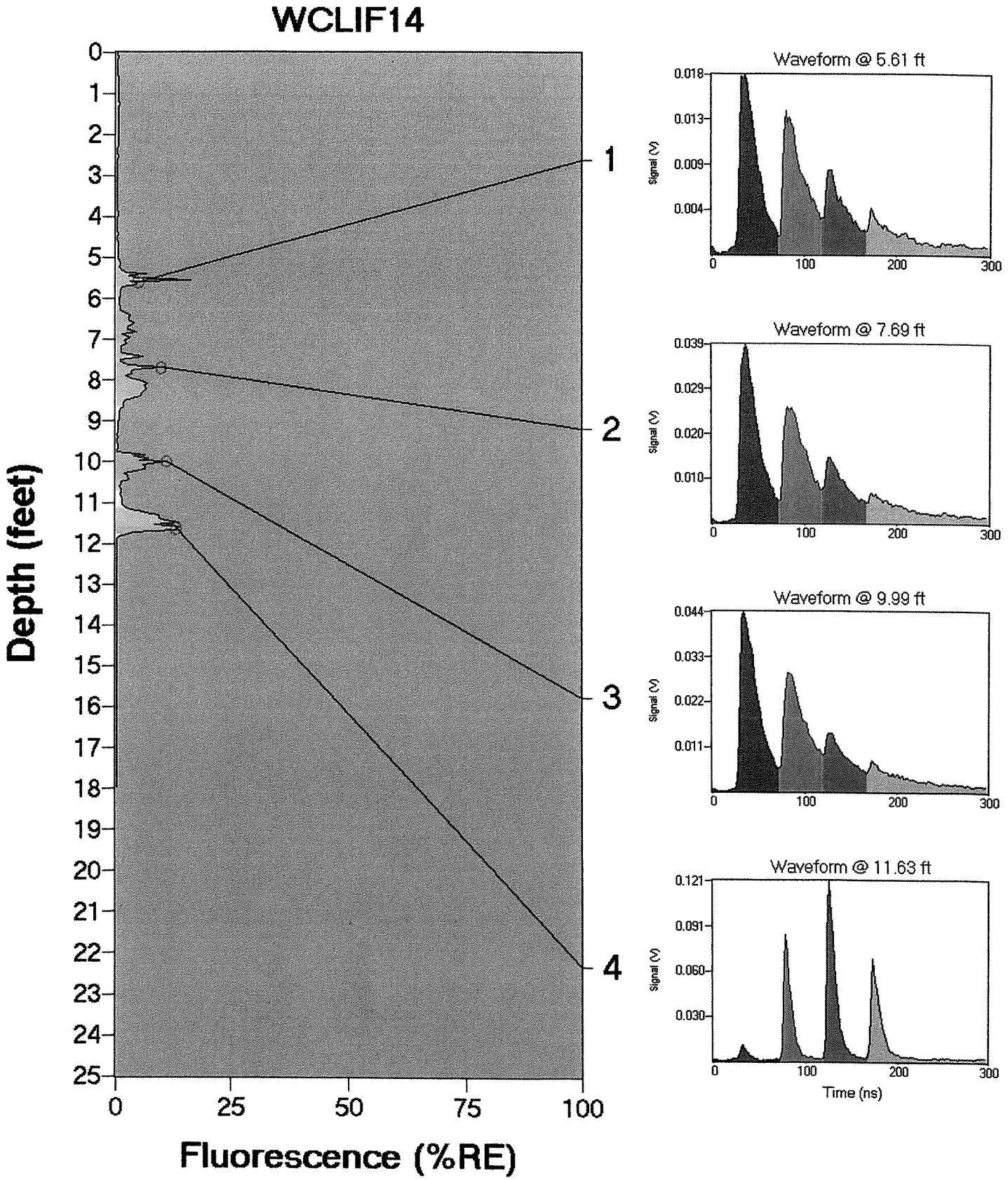
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 9:29:45 AM	Max fluorescence: 2.96% @ 0.00 ft
ROST Unit: DTI-01	Final depth BGS: 18.04 ft



ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 9:51:15 AM	Max fluorescence: 16.25% @ 5.55 ft
ROST Unit: DTI-01	Final depth BGS: 18.00 ft



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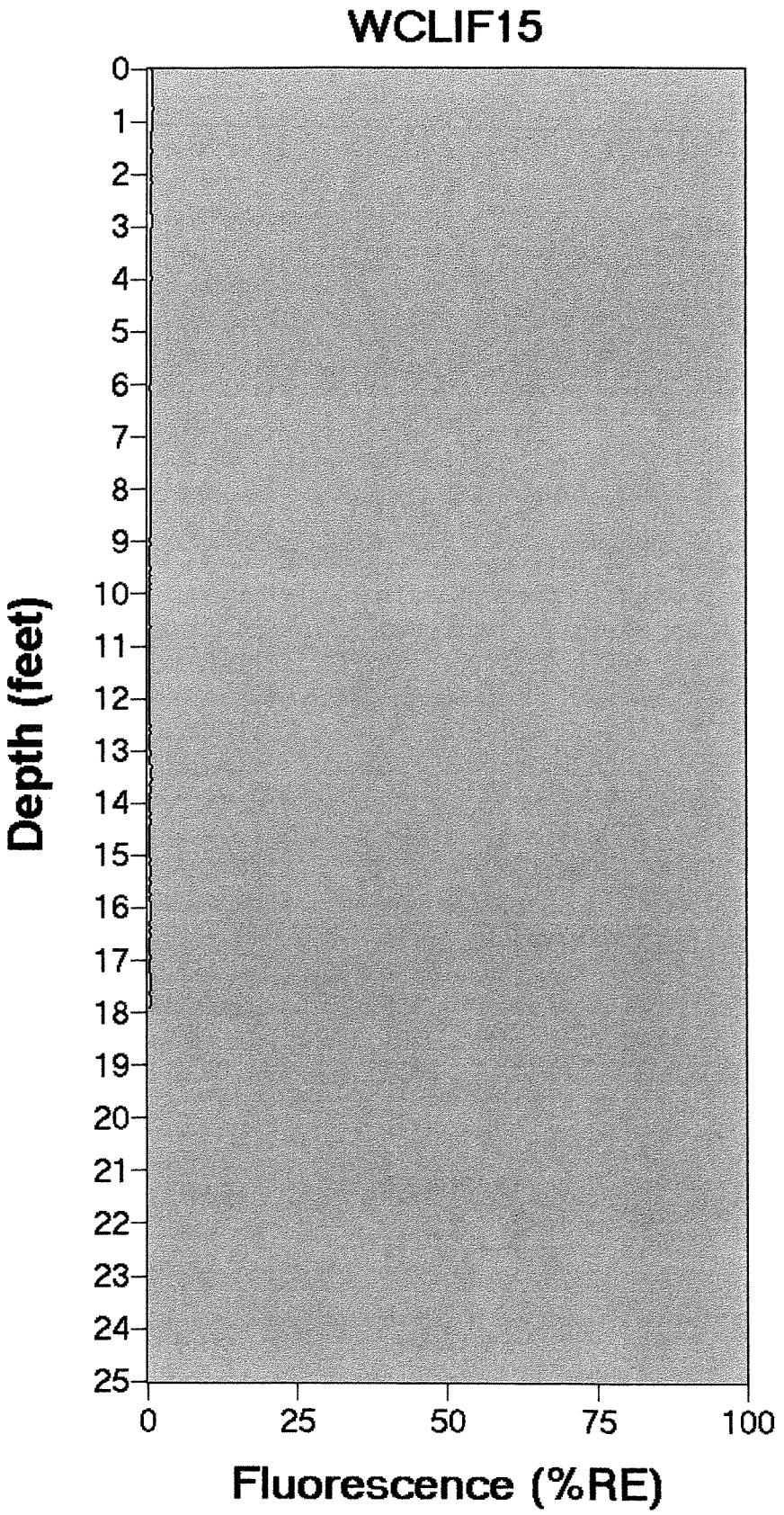
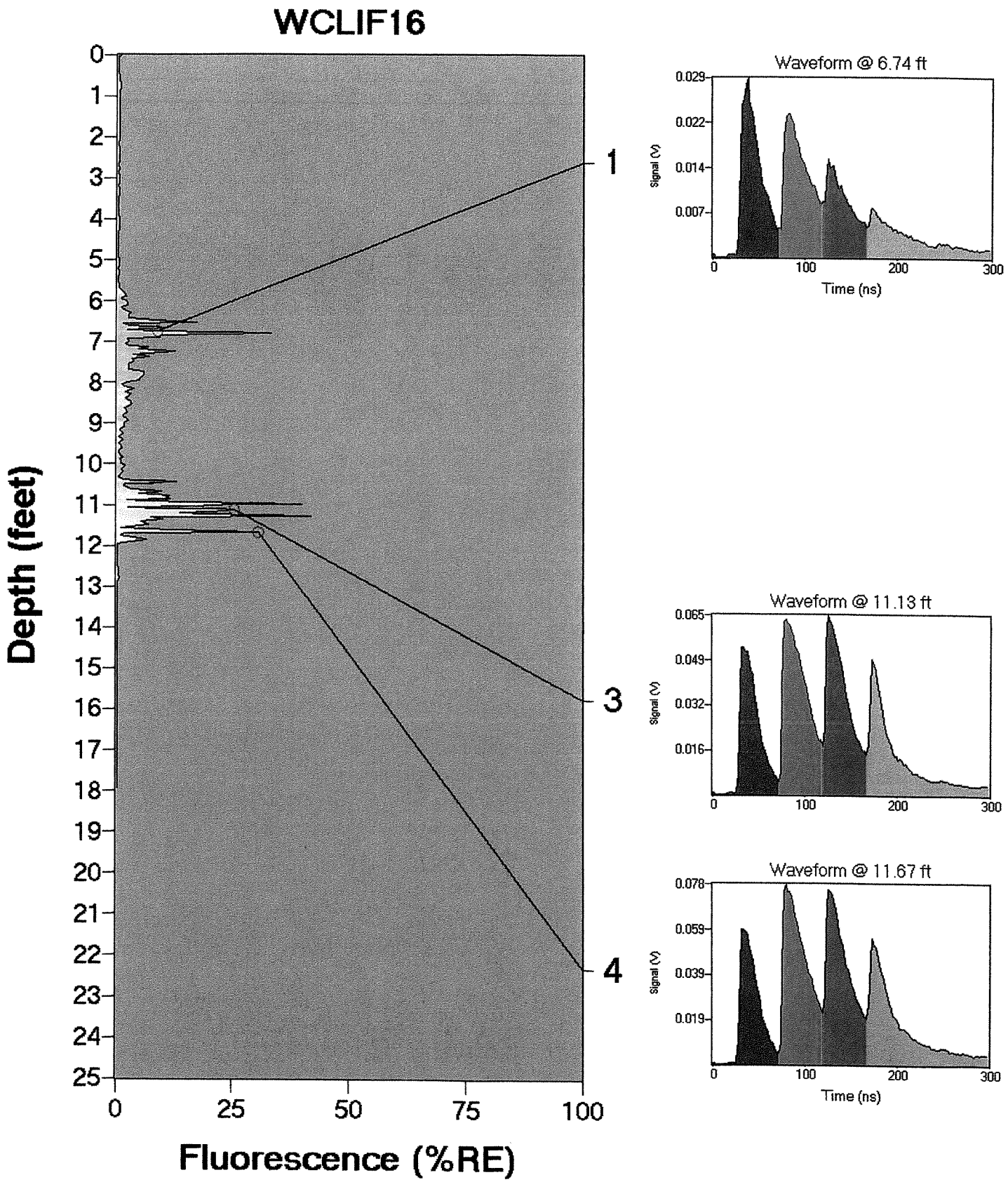
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 10:14:59 AM	Max fluorescence: 0.94% @ 0.74 ft
ROST Unit: DTI-01	Final depth BGS: 17.95 ft



ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 10:33:09 AM	Max fluorescence: 41.74% @ 11.28 ft
ROST Unit: DTI-01	Final depth BGS: 17.96 ft



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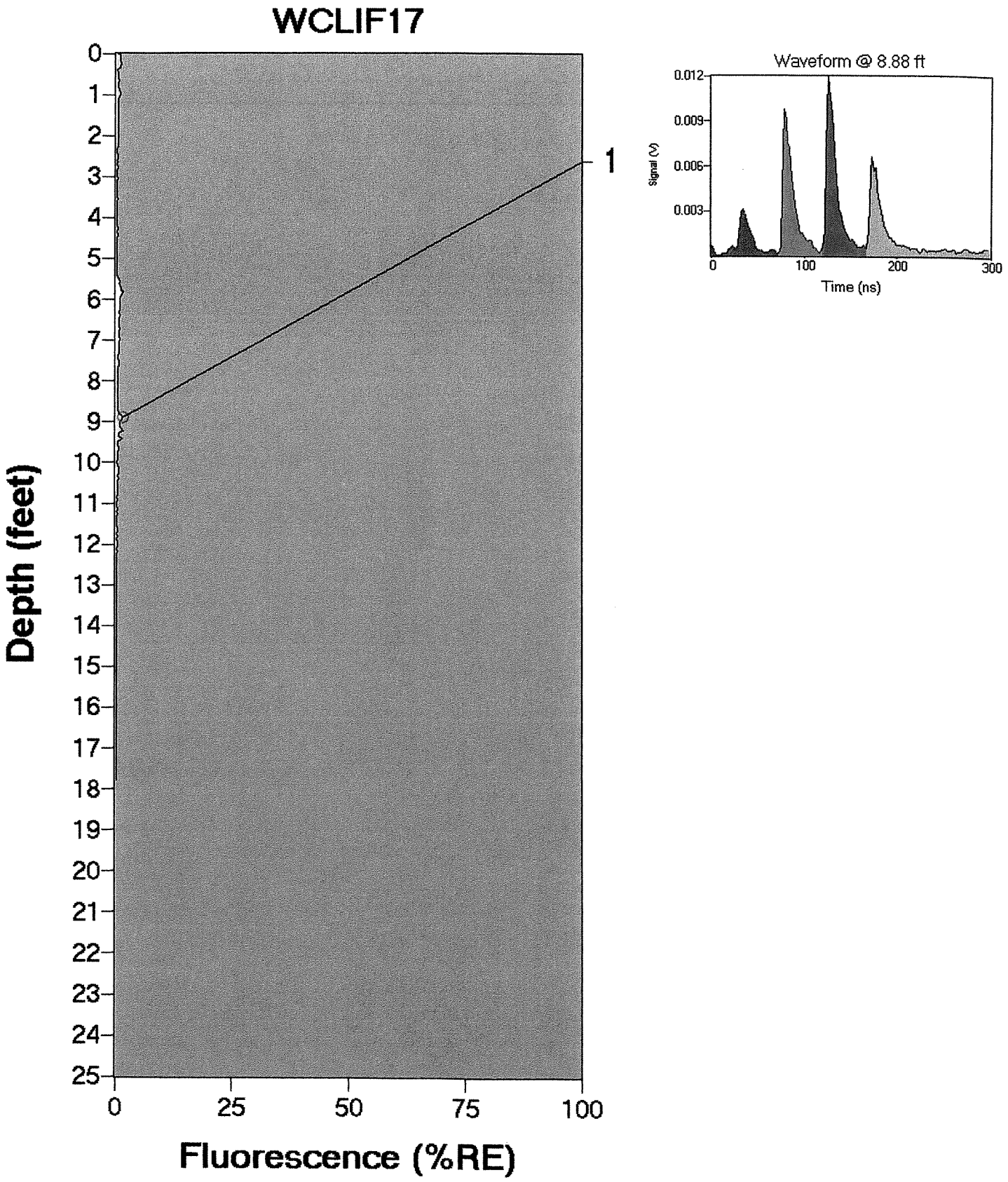
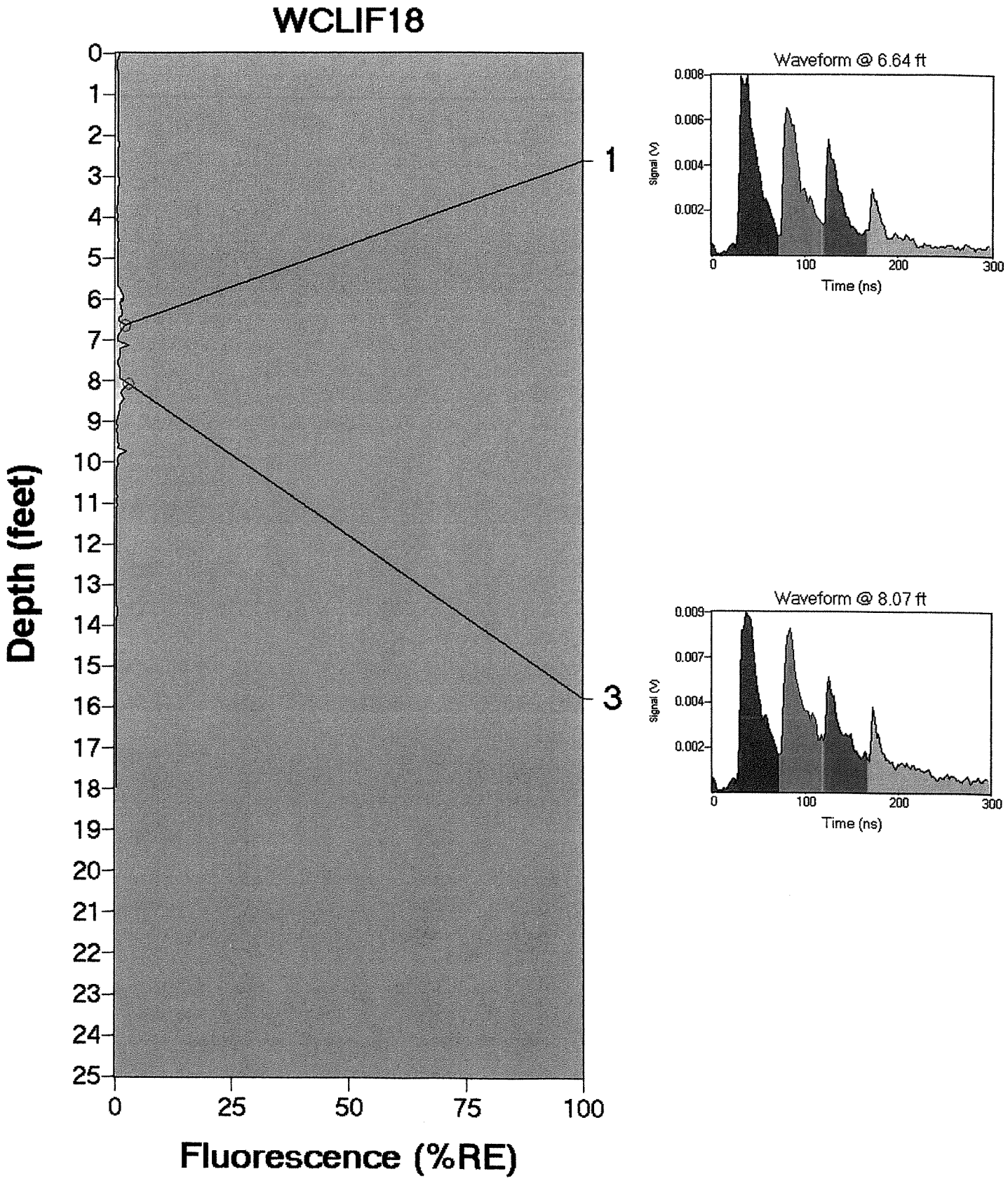
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 10:54:26 AM	Max fluorescence: 1.81% @ 5.81 ft
ROST Unit: DTI-01	Final depth BGS: 17.81 ft



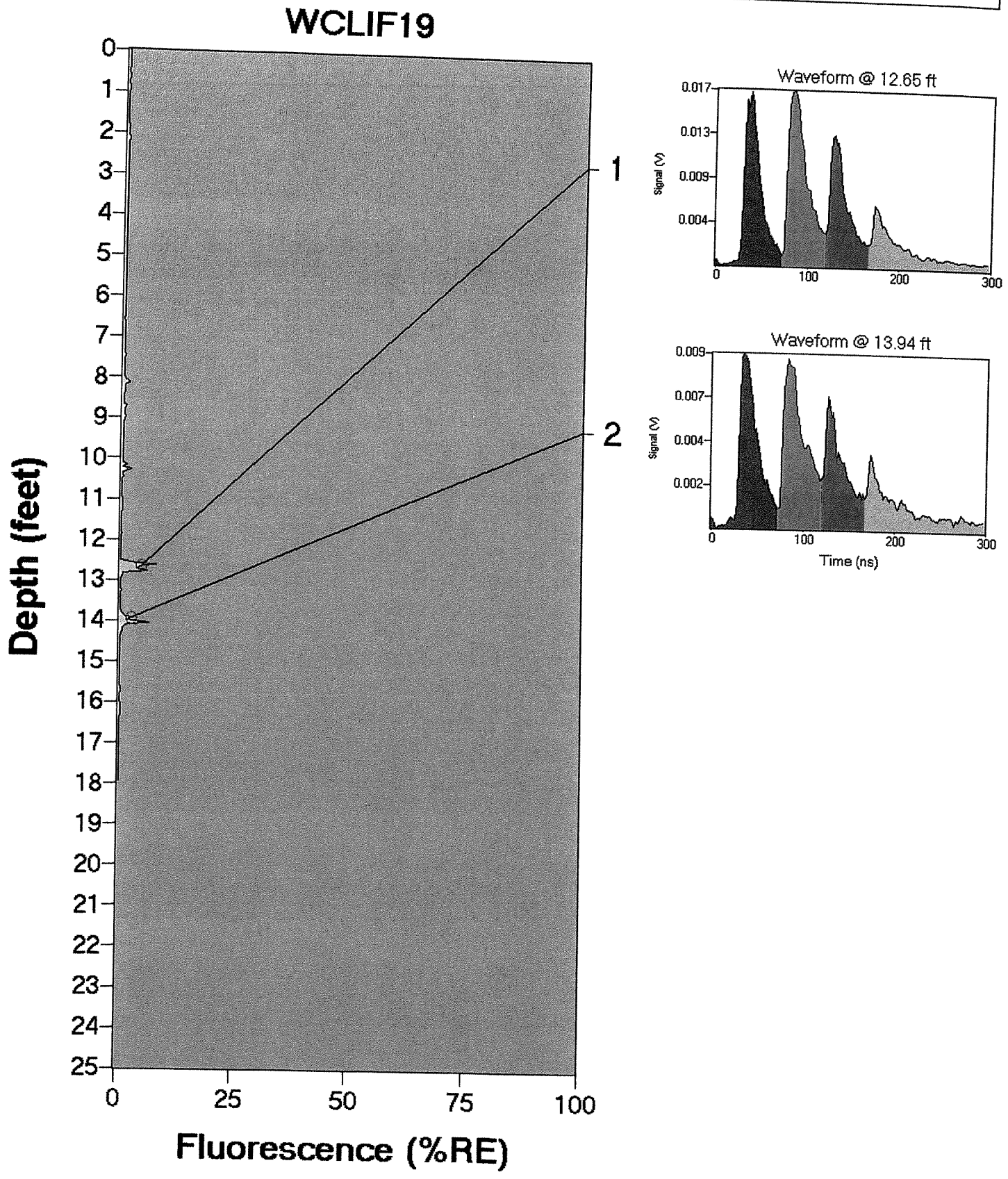
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 11:12:46 AM	Max fluorescence: 2.98% @ 7.12 ft
ROST Unit: DTI-01	Final depth BGS: 18.00 ft



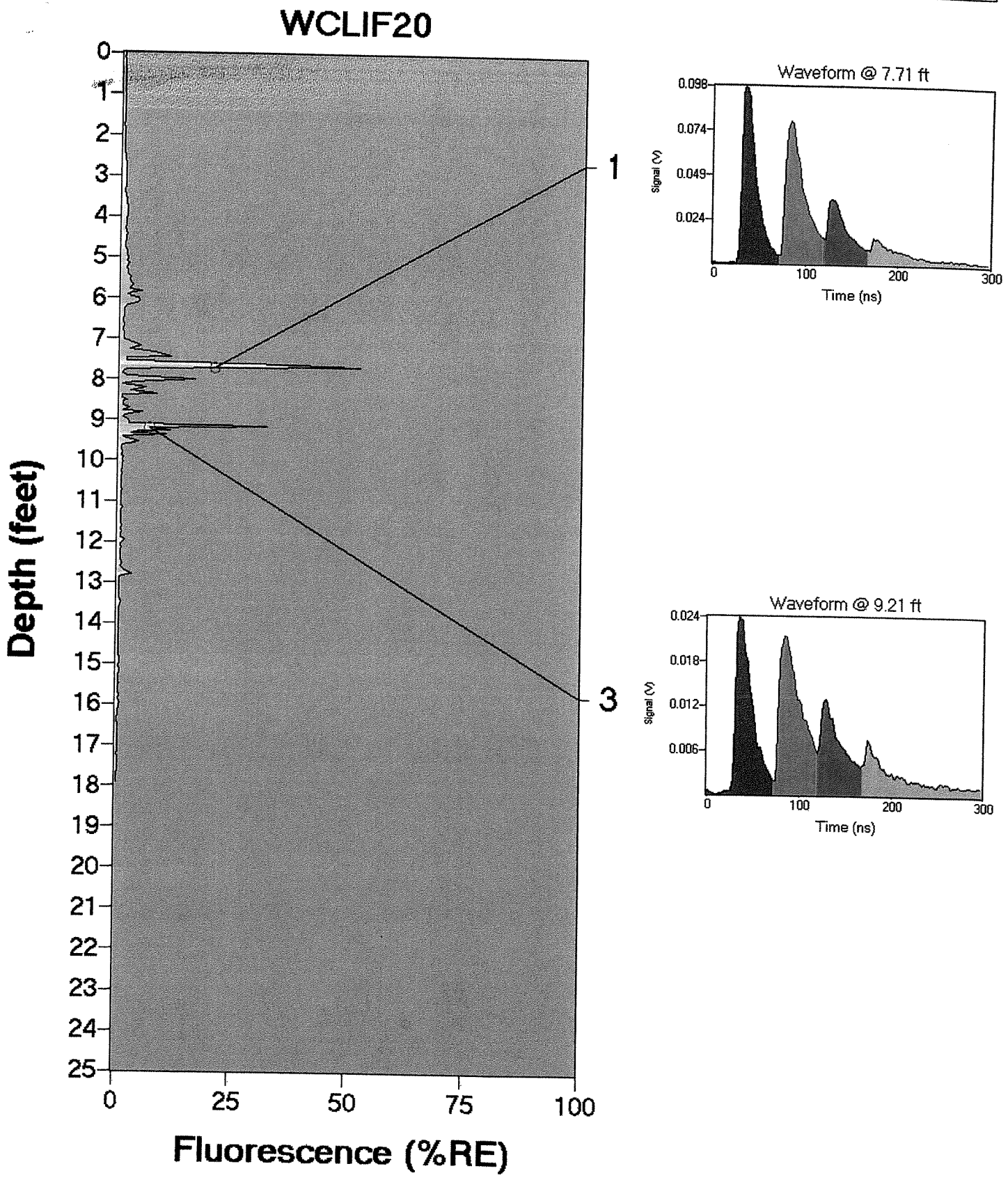
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 11:32:56 AM	Max fluorescence: 8.05% @ 12.62 ft
ROST Unit: DTI-01	Final depth BGS: 17.97 ft



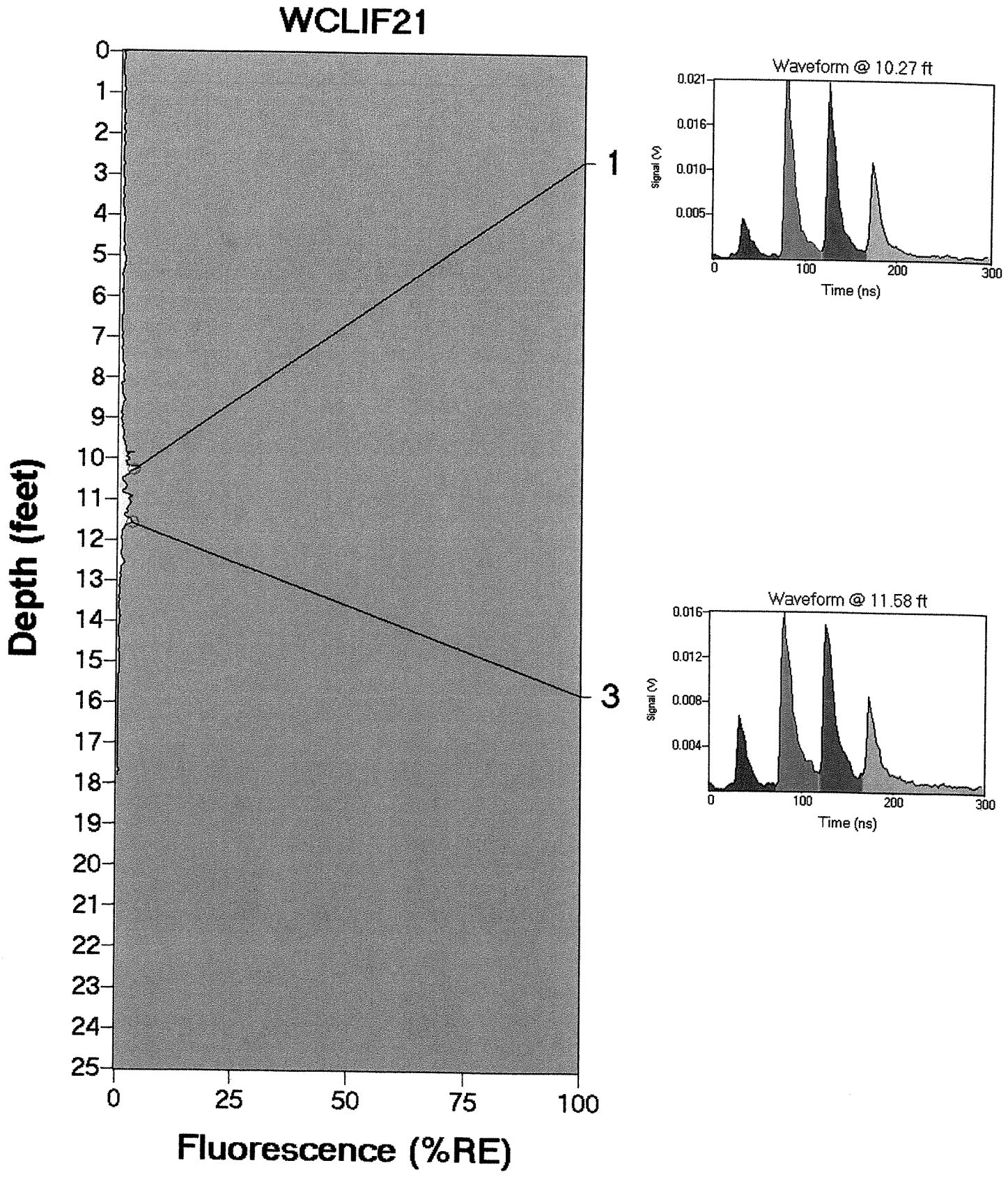
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 11:51:54 AM	Max fluorescence: 52.05% @ 7.68 ft
ROST Unit: DTI-01	Final depth BGS: 17.94 ft



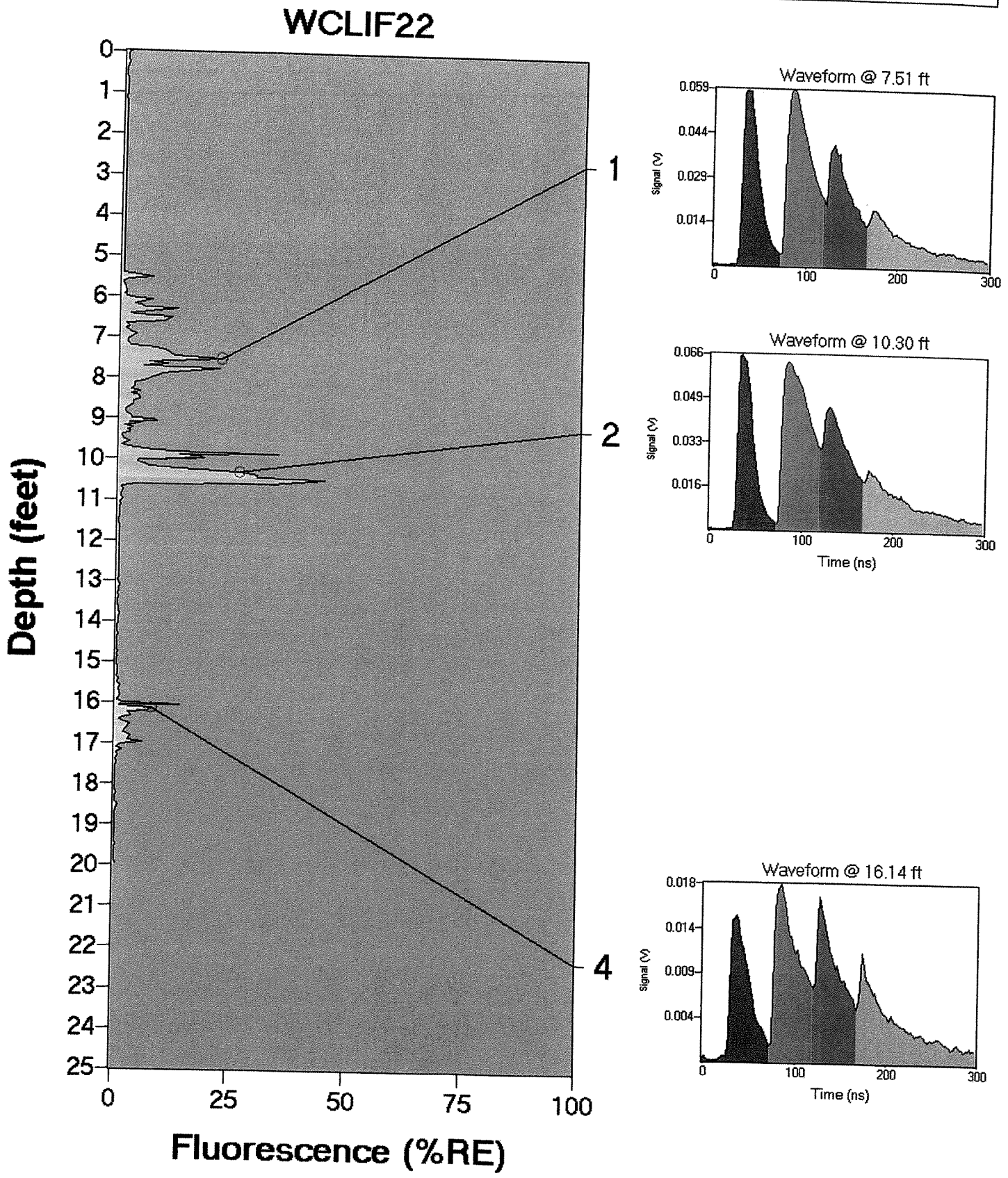
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 12:10:41 PM	Max fluorescence: 4.67% @ 10.22 ft
ROST Unit: DTI-01	Final depth BGS: 17.85 ft



ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 12:28:50 PM	Max fluorescence: 44.57% @ 10.50 ft
ROST Unit: DTI-01	Final depth BGS: 20.00 ft



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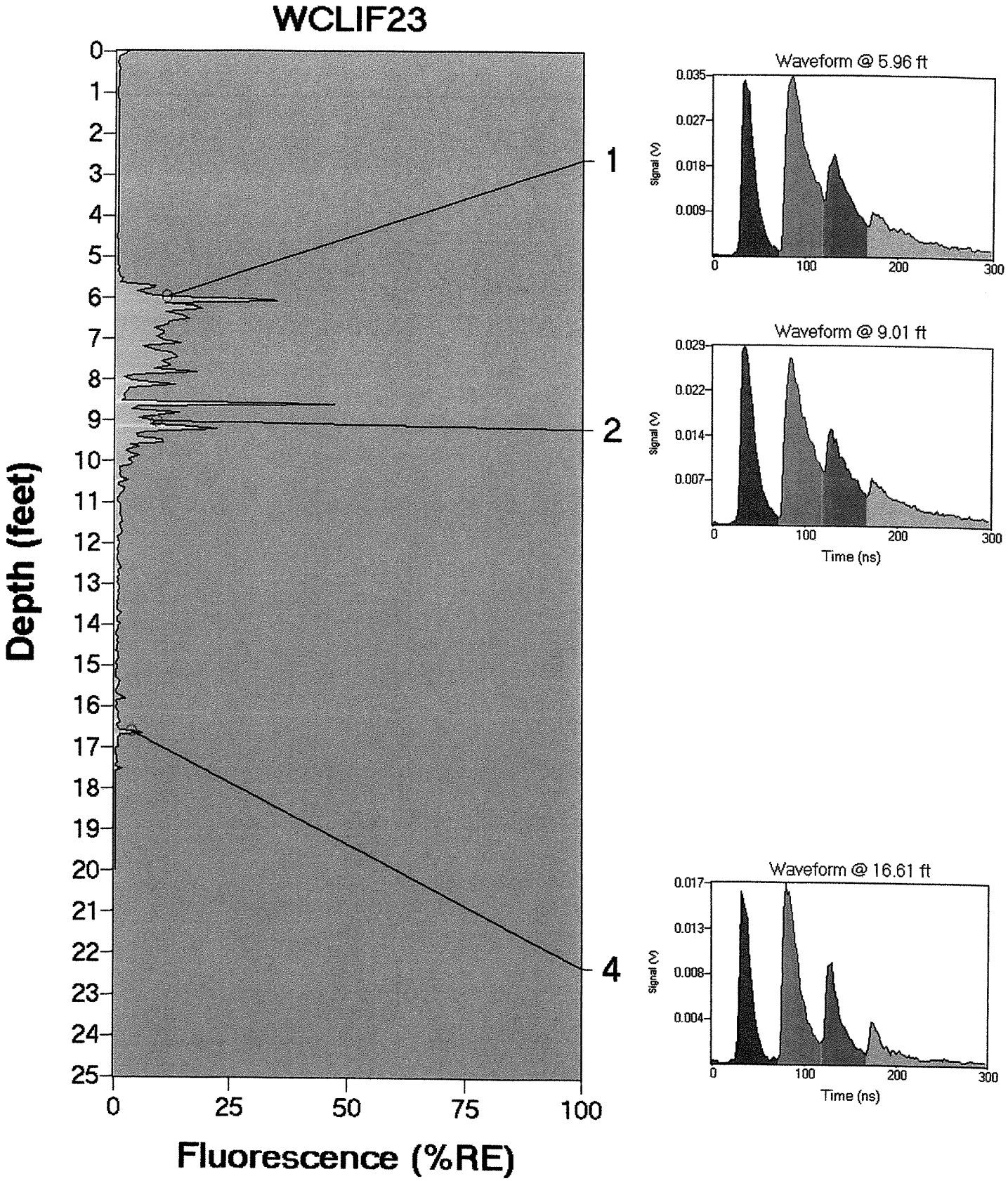
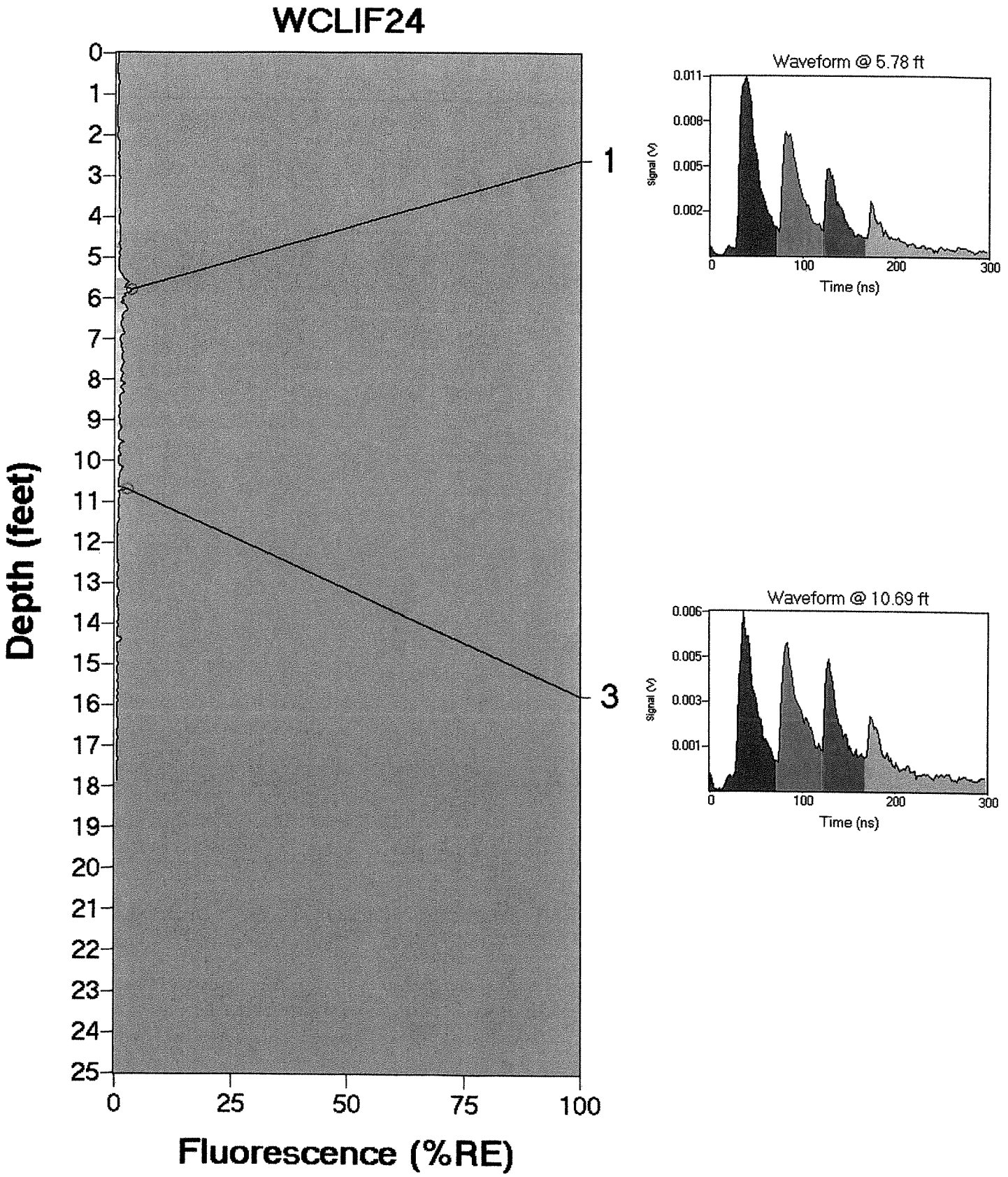
ROST Fluorescence Response Data

Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 12:51:24 PM	Max fluorescence: 46.91% @ 8.60 ft
ROST Unit: DTI-01	Final depth BGS: 20.01 ft

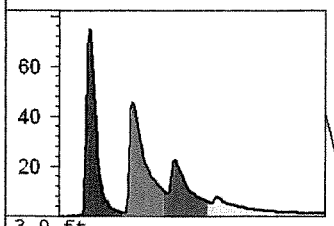


ROST Fluorescence Response Data

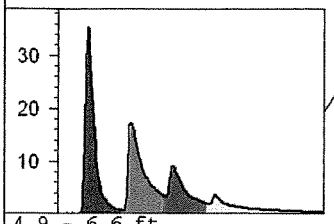
Site: CSI Watford City, ND	Operator: Steve Adamek
Client: EERC	GPS Fix:
Date/Time: 11/10/2005 @ 2:05:46 PM	Max fluorescence: 3.61% @ 5.78 ft
ROST Unit: DTI-01	Final depth BGS: 17.88 ft



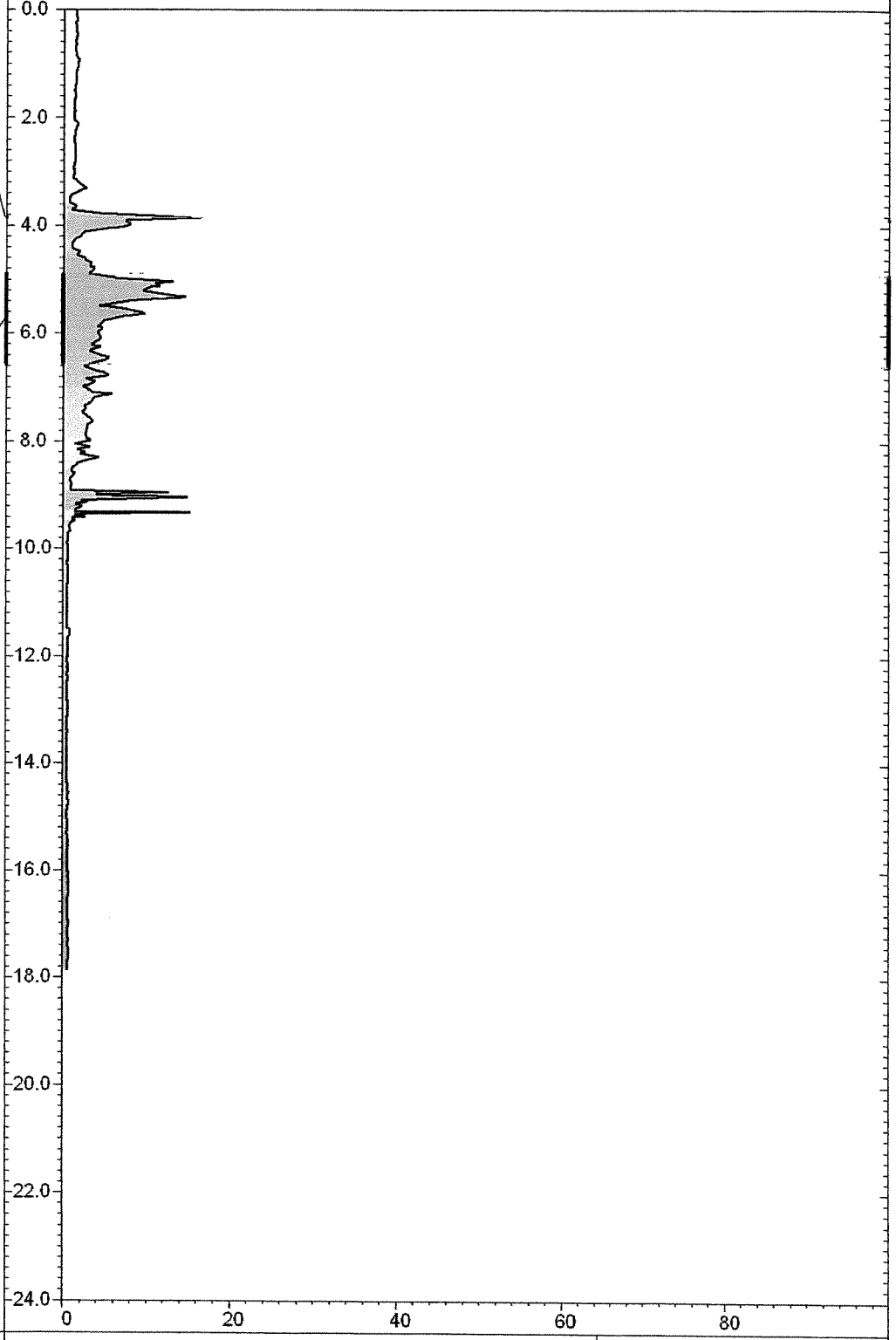
Call outs



3.9 ft
17.0 %RE



4.9 - 6.6 ft
6.6 %RE (± 3.4)



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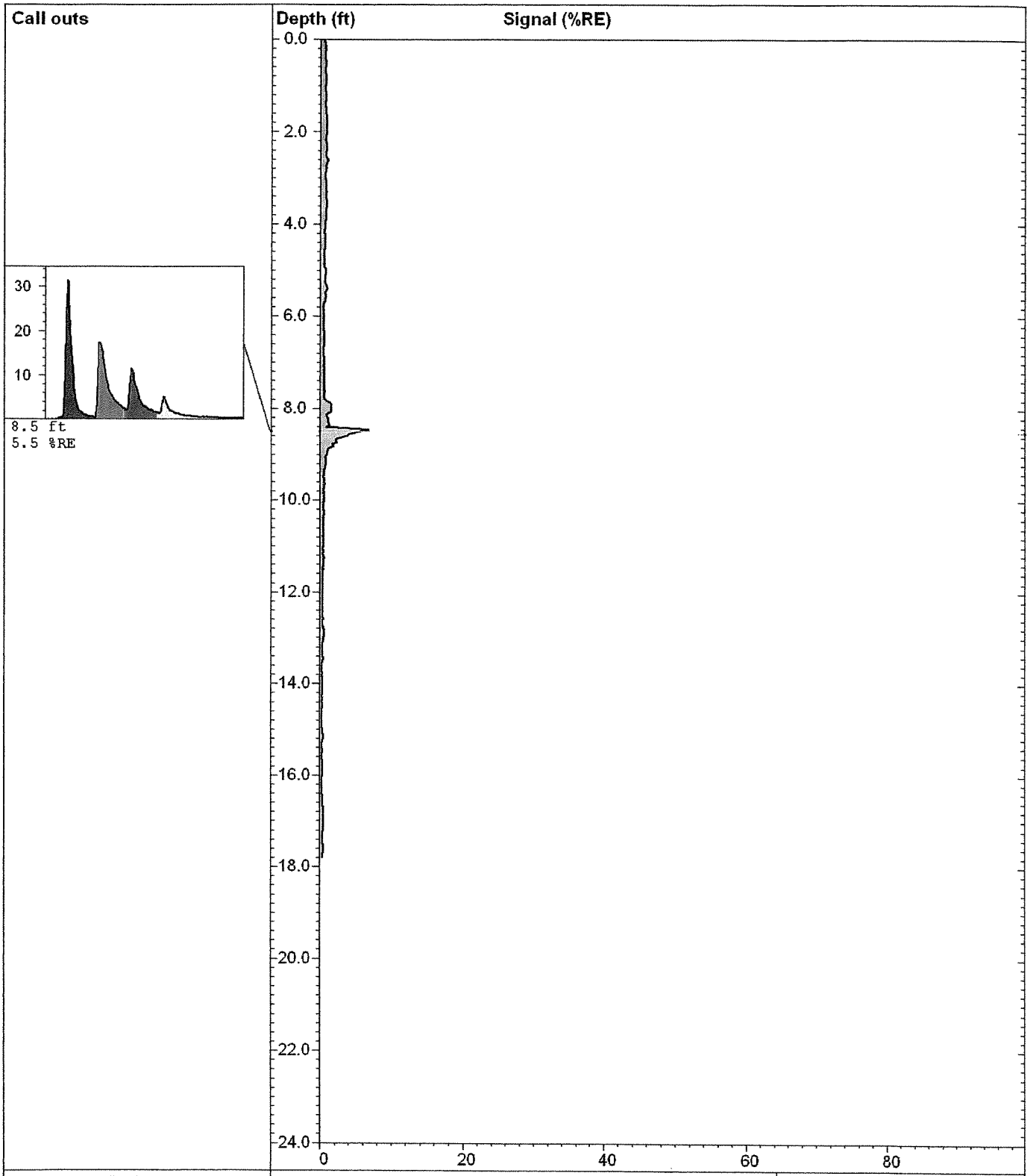
LIF25		**UVOST**
Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.89 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **17.0 % @ 3.86 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 8:06:37 AM**



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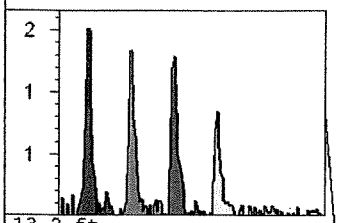
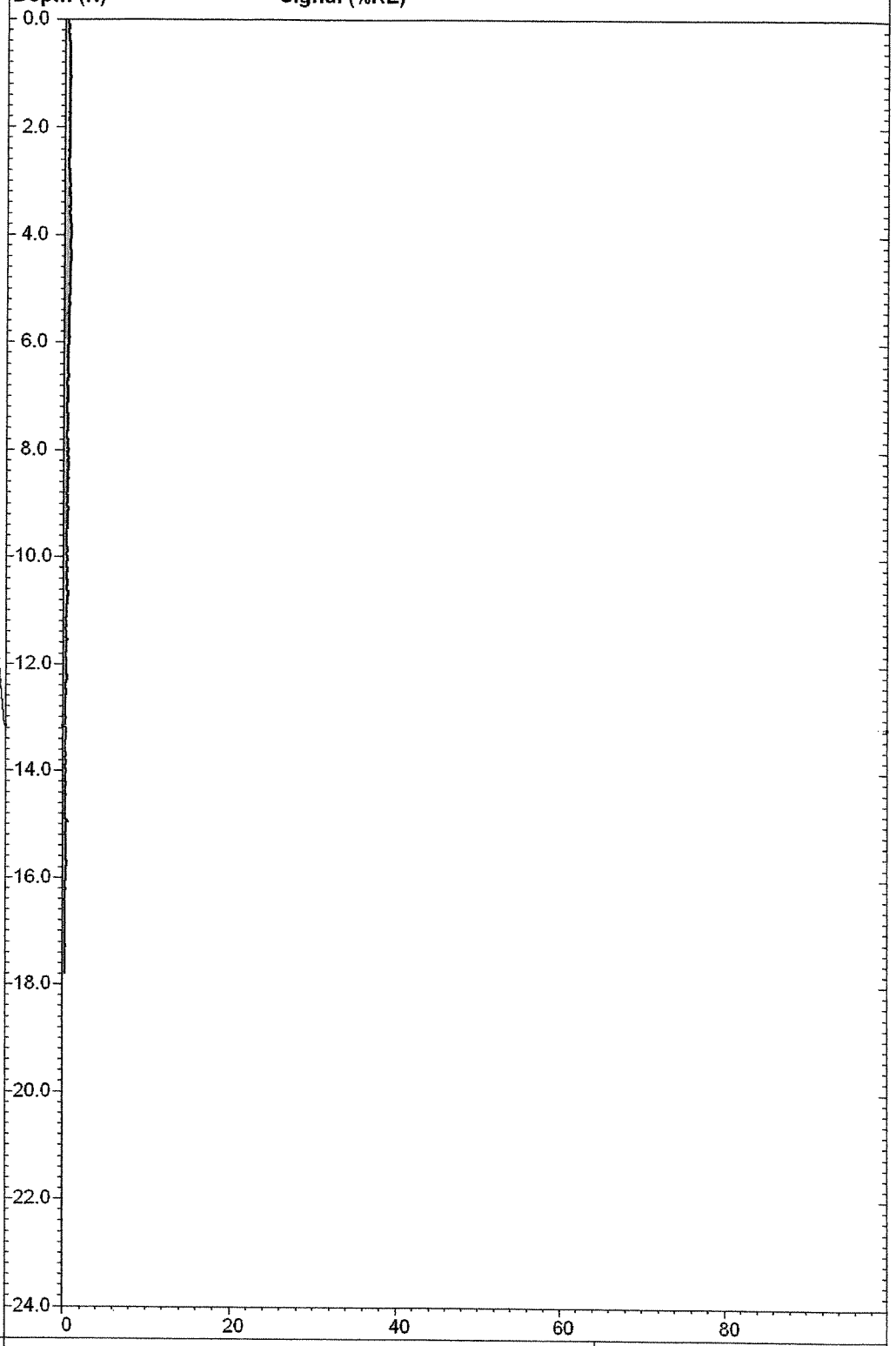
LIF26

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.82 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **7.0 % @ 8.46 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 8:25:36 AM**

Call outs





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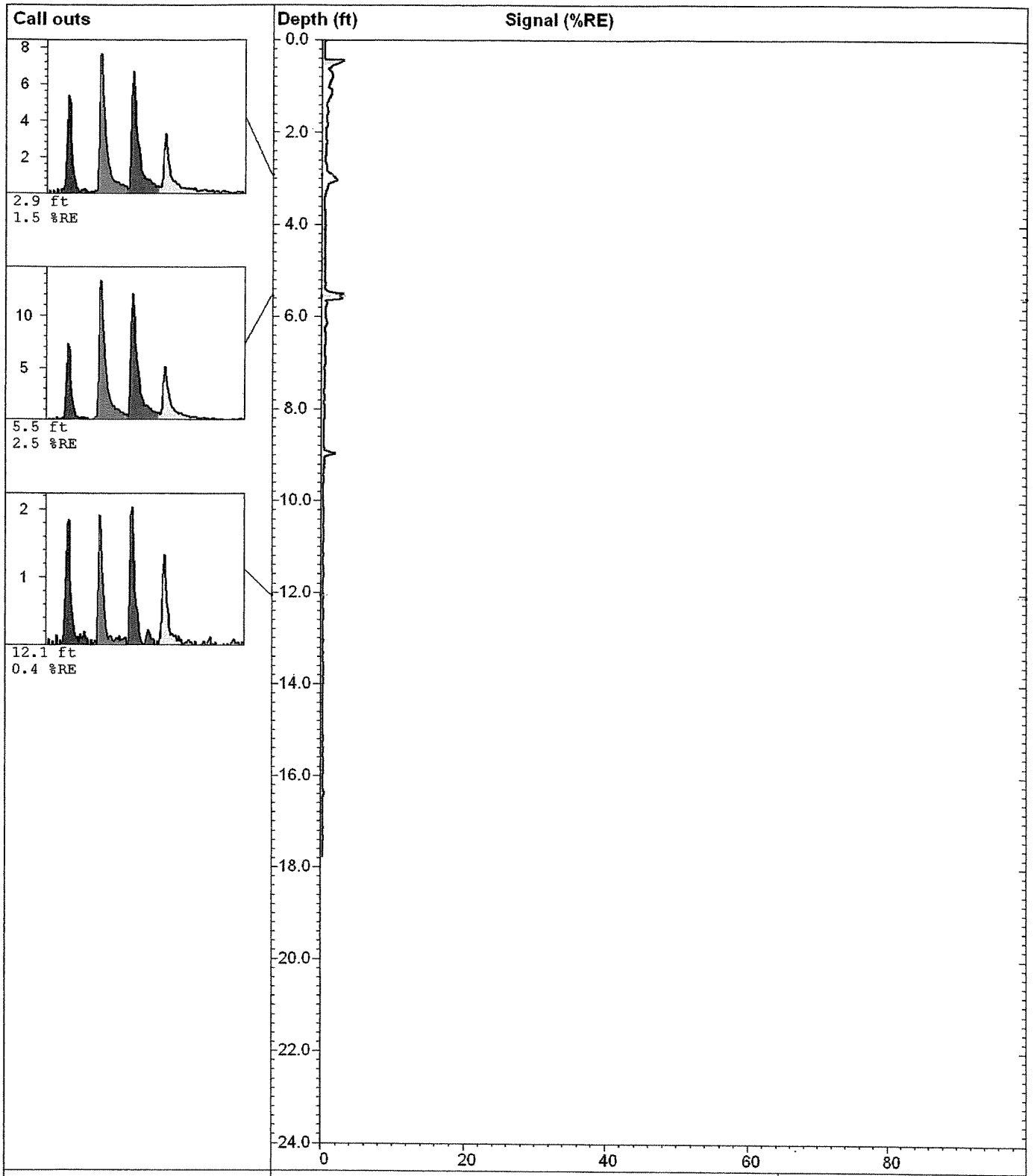
LIF27

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.81 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **0.9 % @ 4.05 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 8:42:06 AM**



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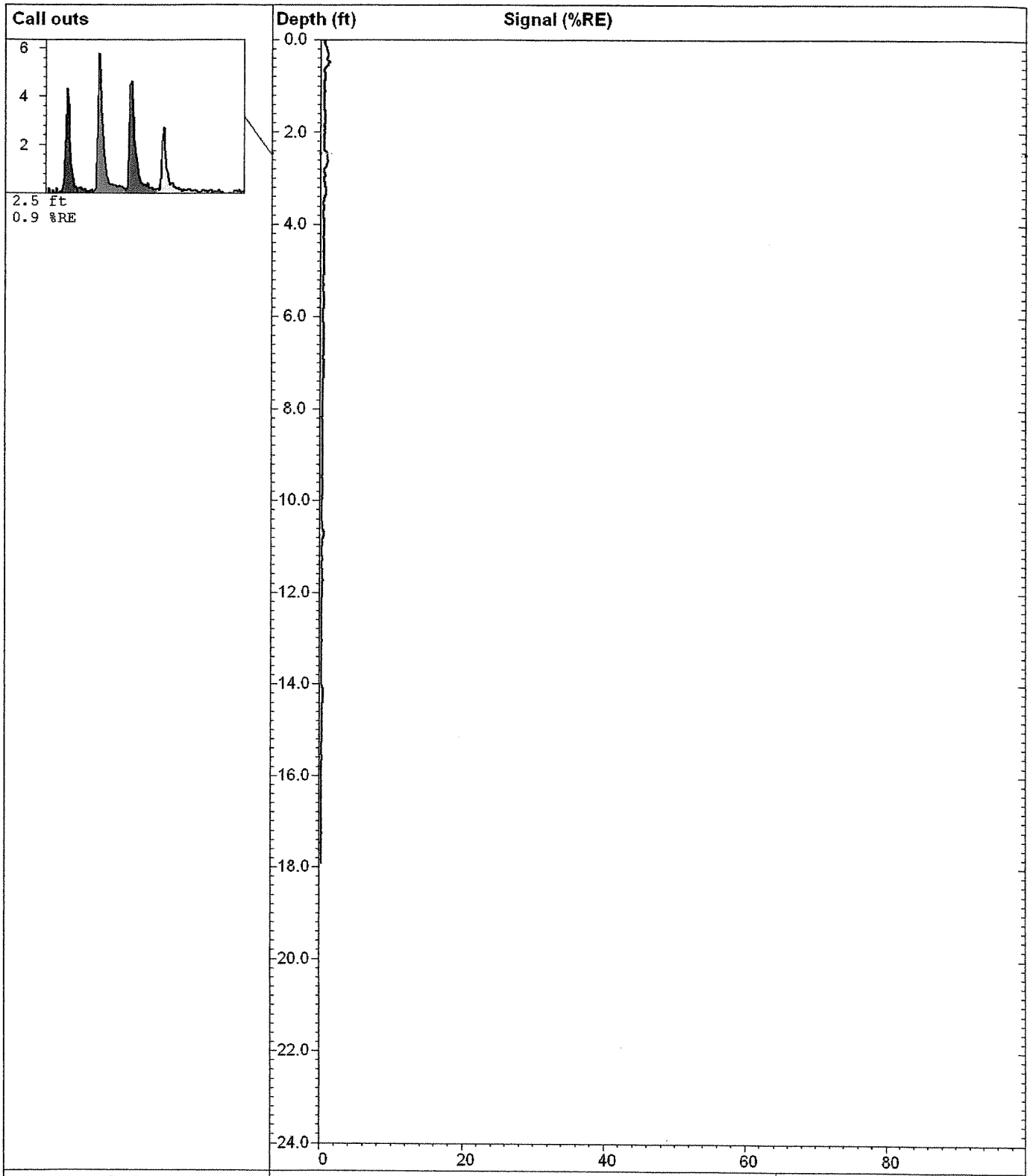
LIF28

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.80 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **3.2 % @ 0.44 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 9:02:02 AM**



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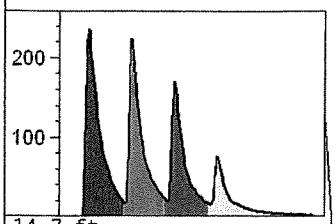
LIF29

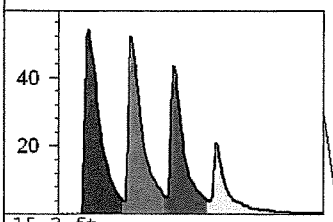
UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.94 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **1.3 % @ 0.48 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 9:19:02 AM**

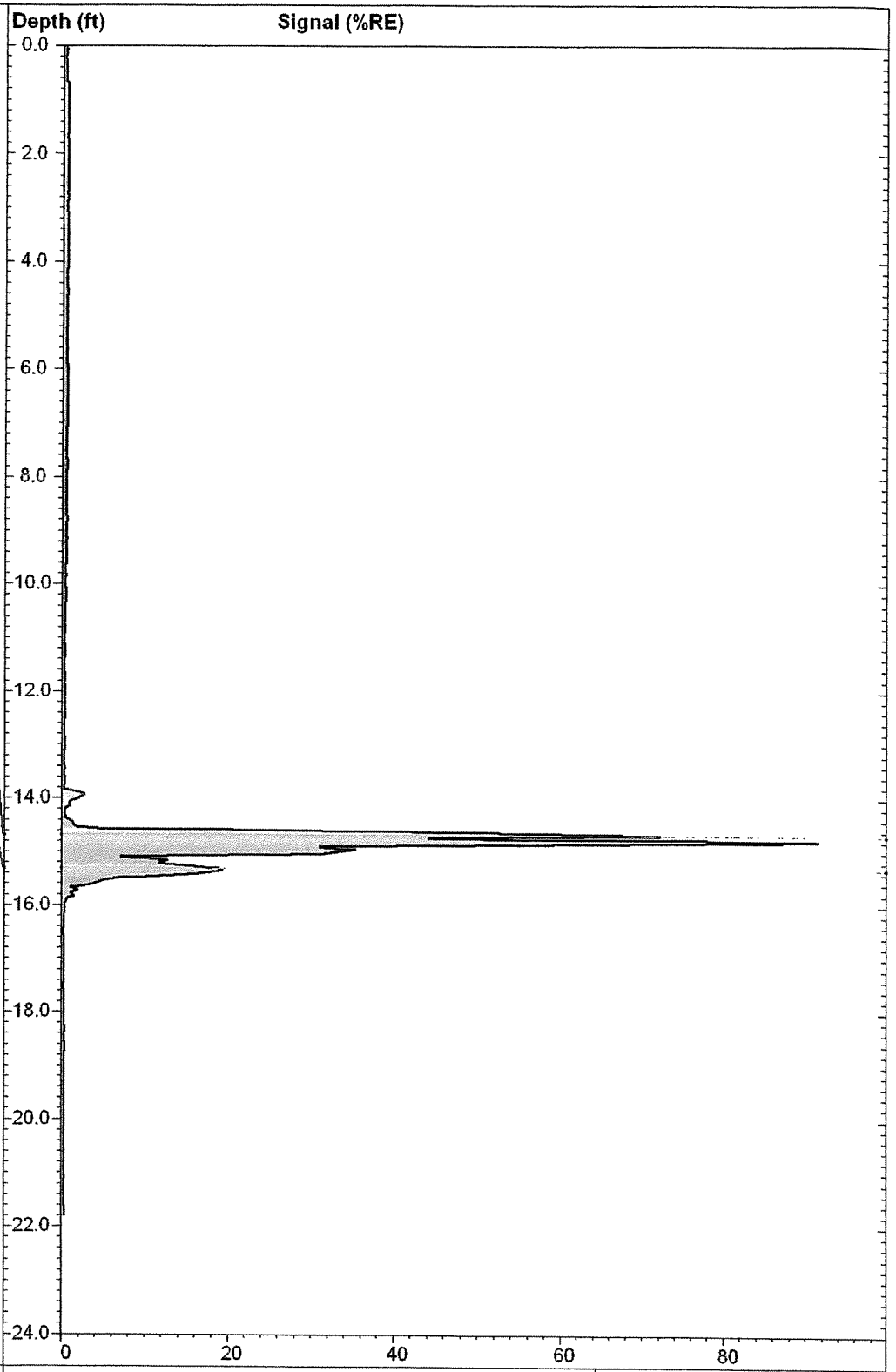
Call outs



14.7 ft
73.9 %RE



15.3 ft
18.8 %RE



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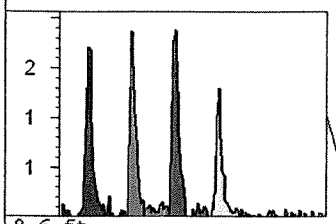
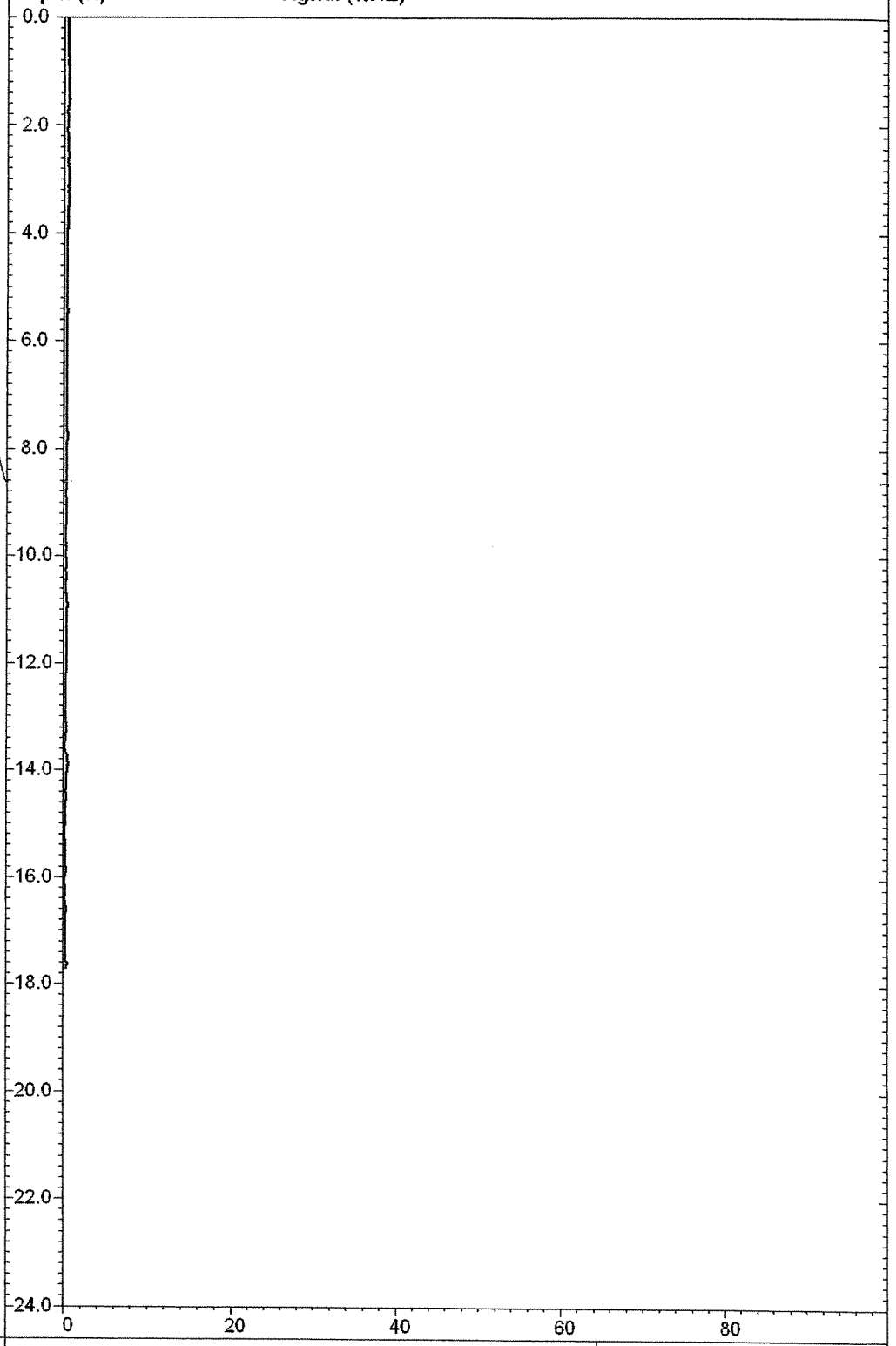
LIF30

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **21.82 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **94.6 % @ 14.80 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 9:35:56 AM**

Call outs





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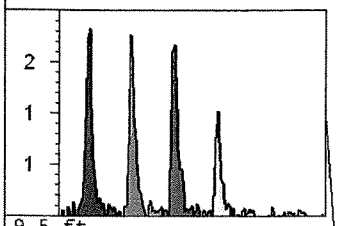
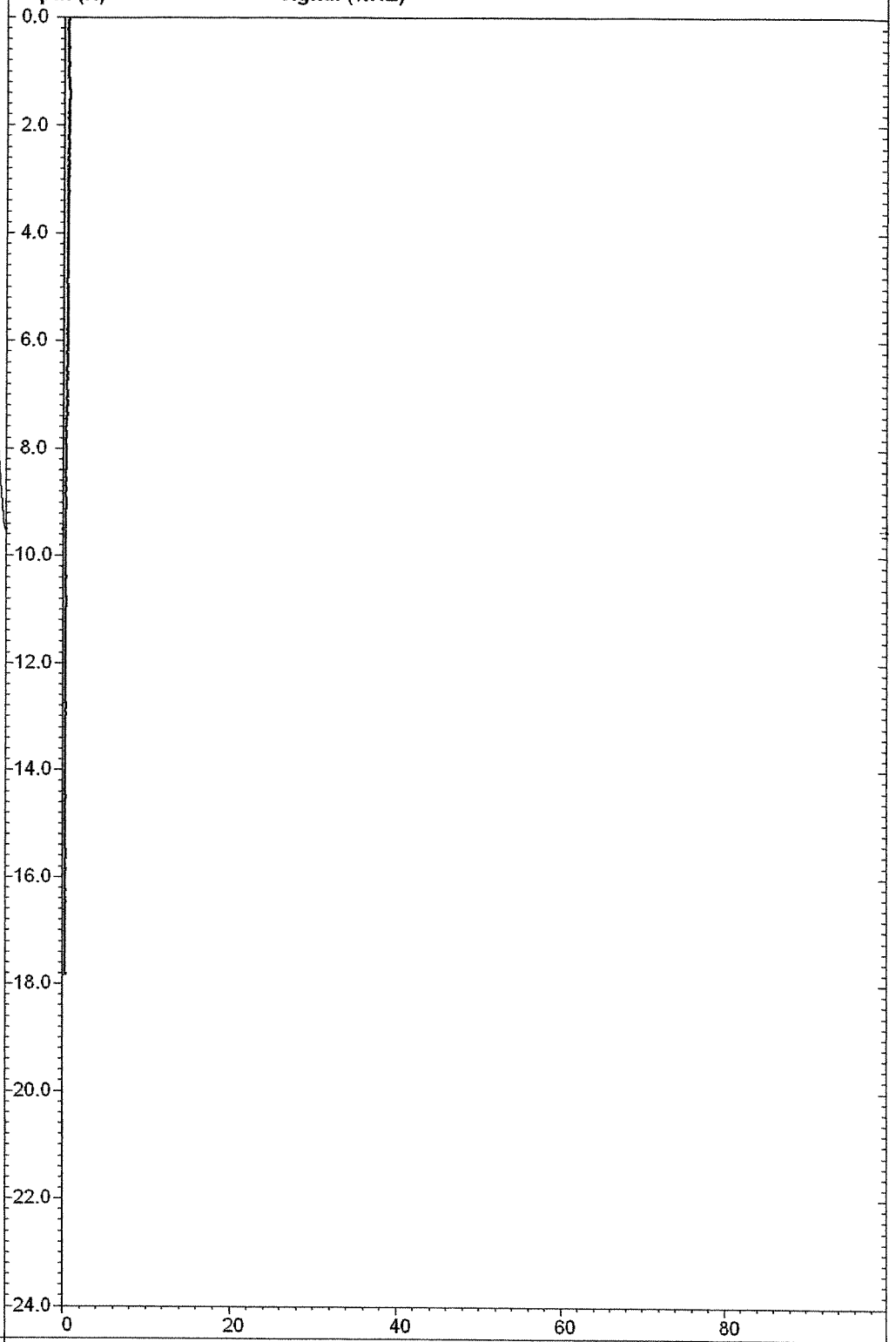
LIF31

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.73 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **0.7 % @ 1.52 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 9:52:35 AM**

Call outs





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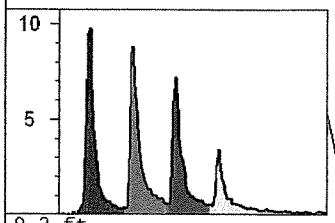
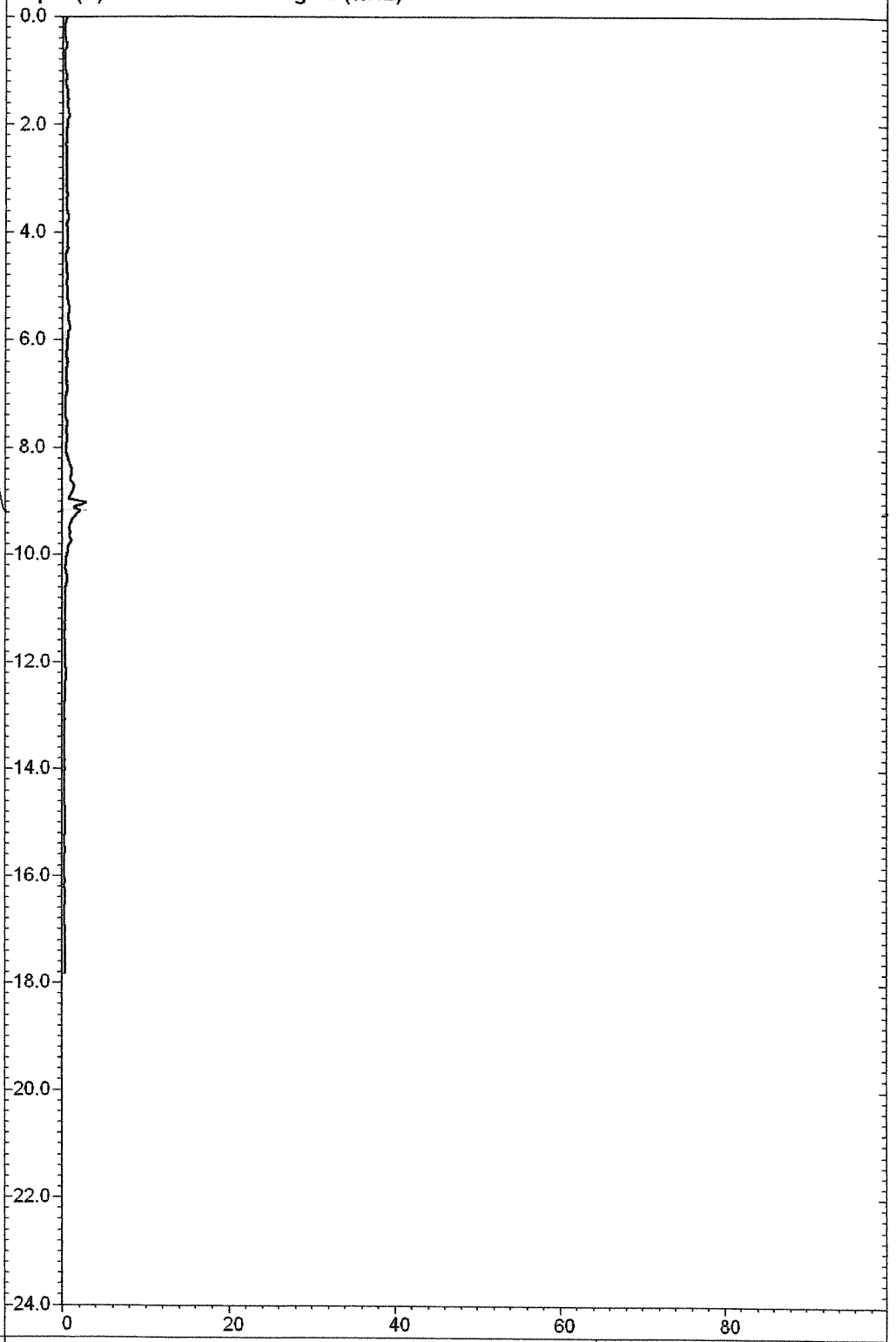
LIF32

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.84 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **0.7 % @ 1.48 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 10:11:12 AM**

Call outs





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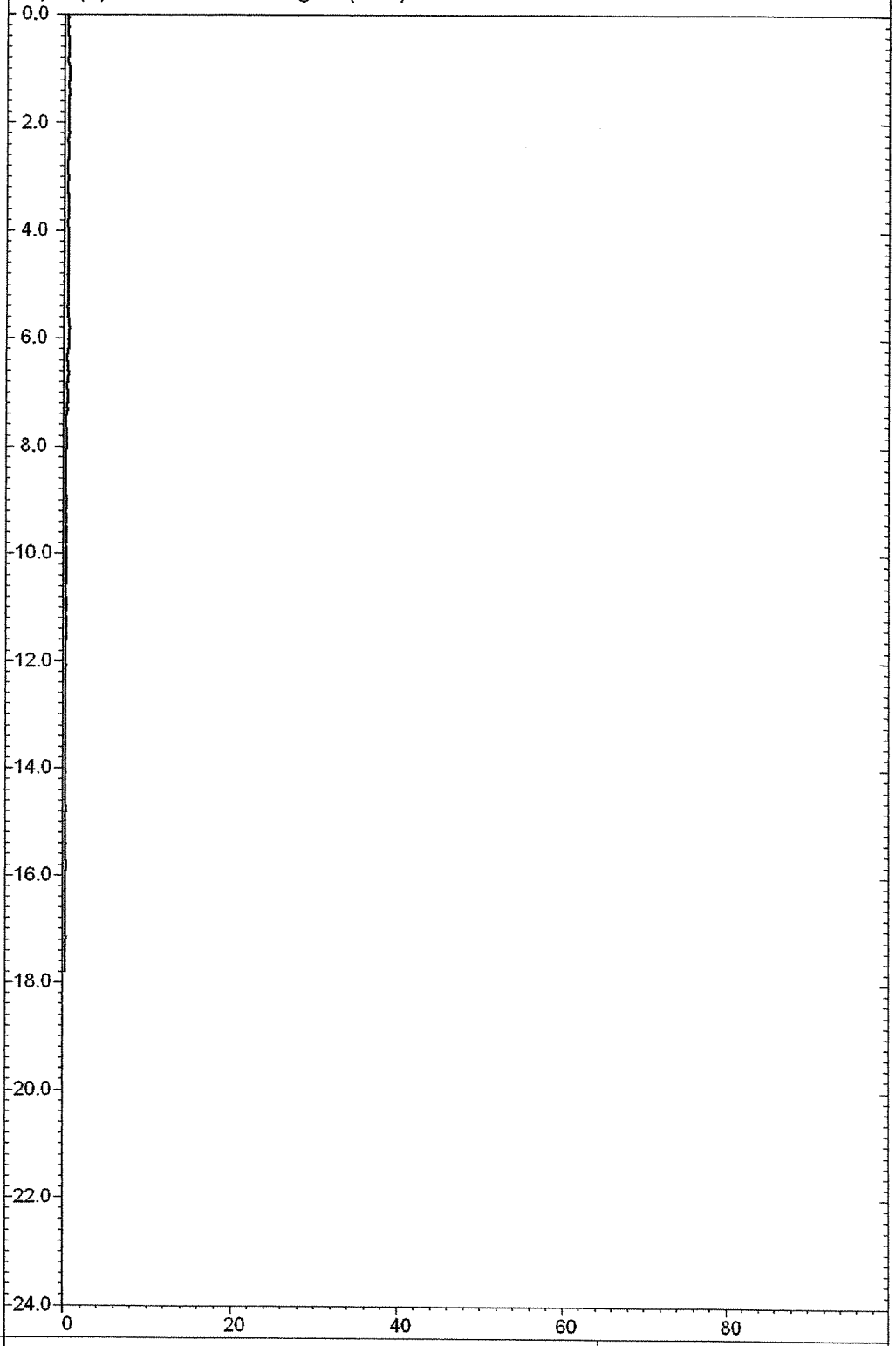
LIF33

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.85 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **2.9 % @ 9.02 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 10:30:02 AM**

Call outs	Depth (ft) Signal (%RE)



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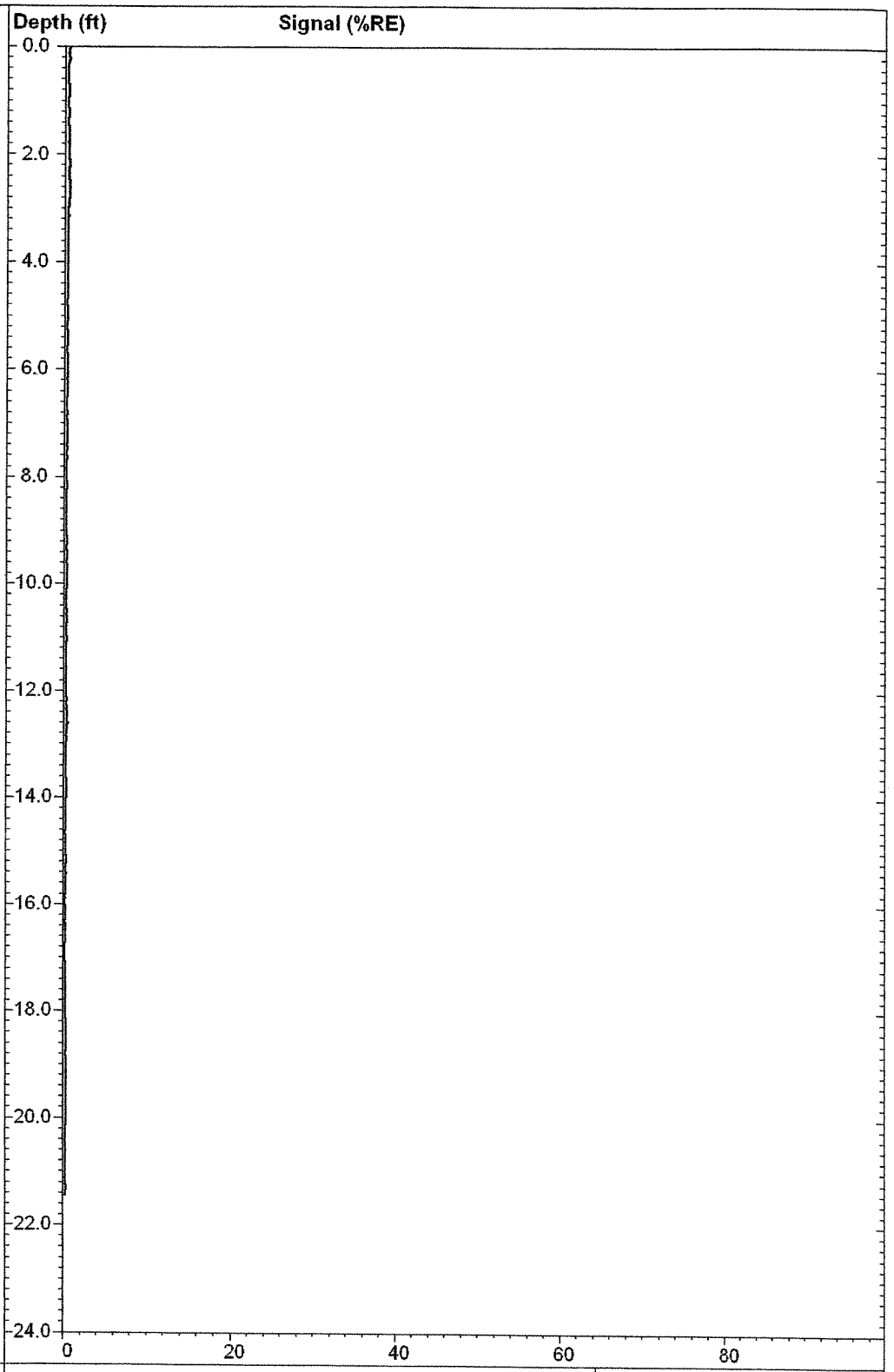
LIF34

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.81 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **0.7 % @ 5.80 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 10:51:42 AM**

Call outs



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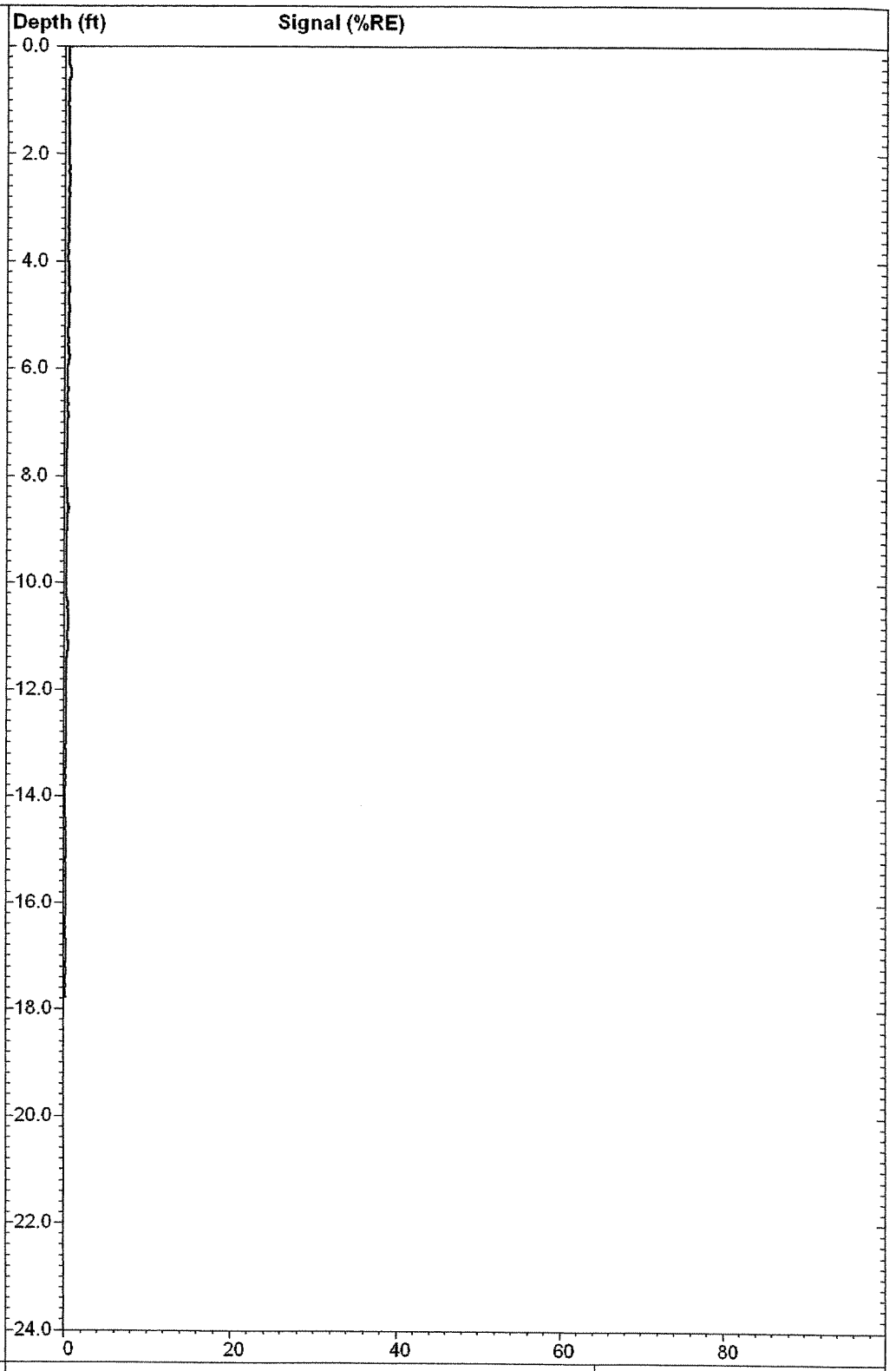
LIF35

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **21.47 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **0.6 % @ 0.00 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 11:07:02 AM**

Call outs



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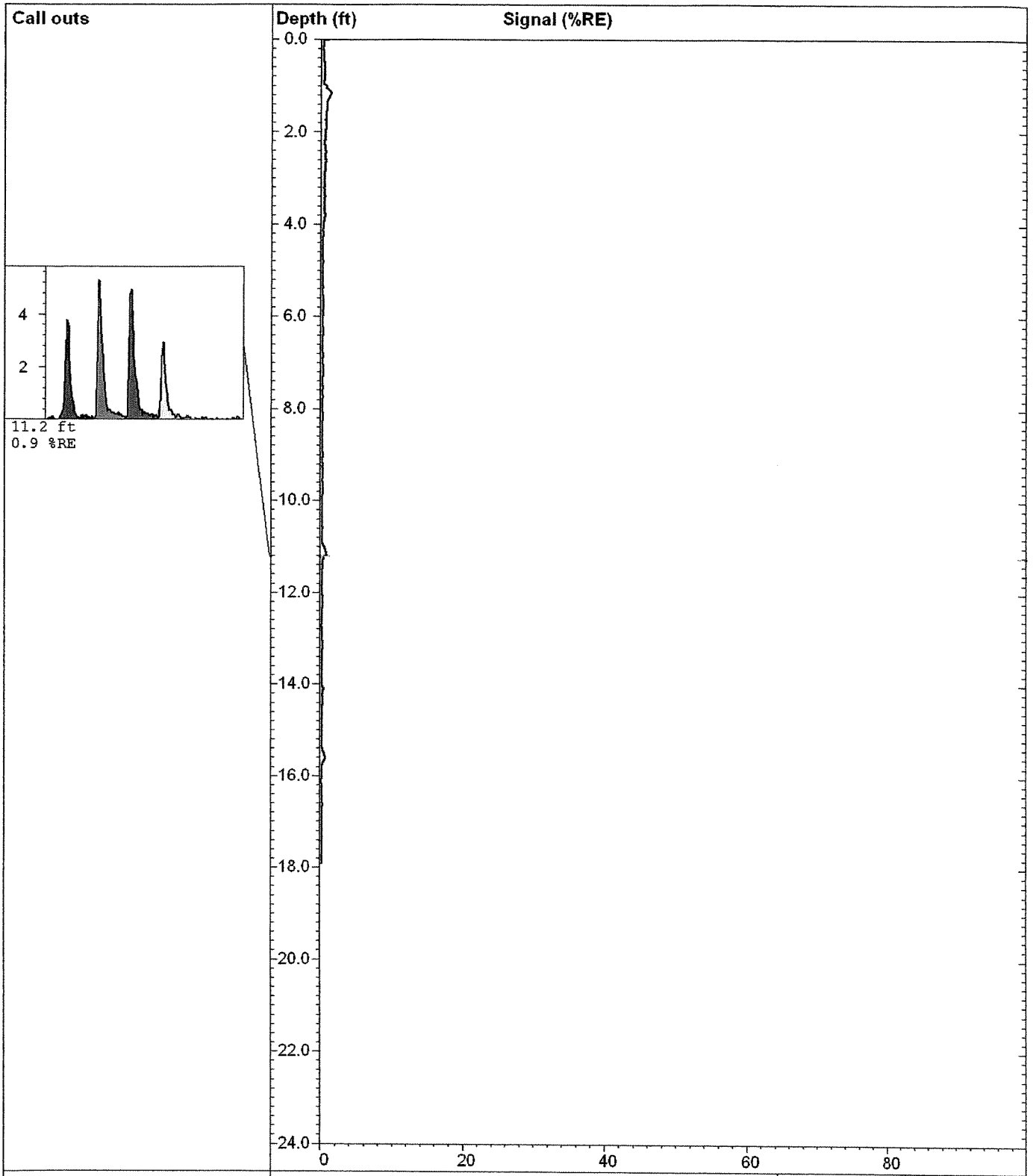
LIF36

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.80 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **0.8 % @ 0.00 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 11:22:54 AM**



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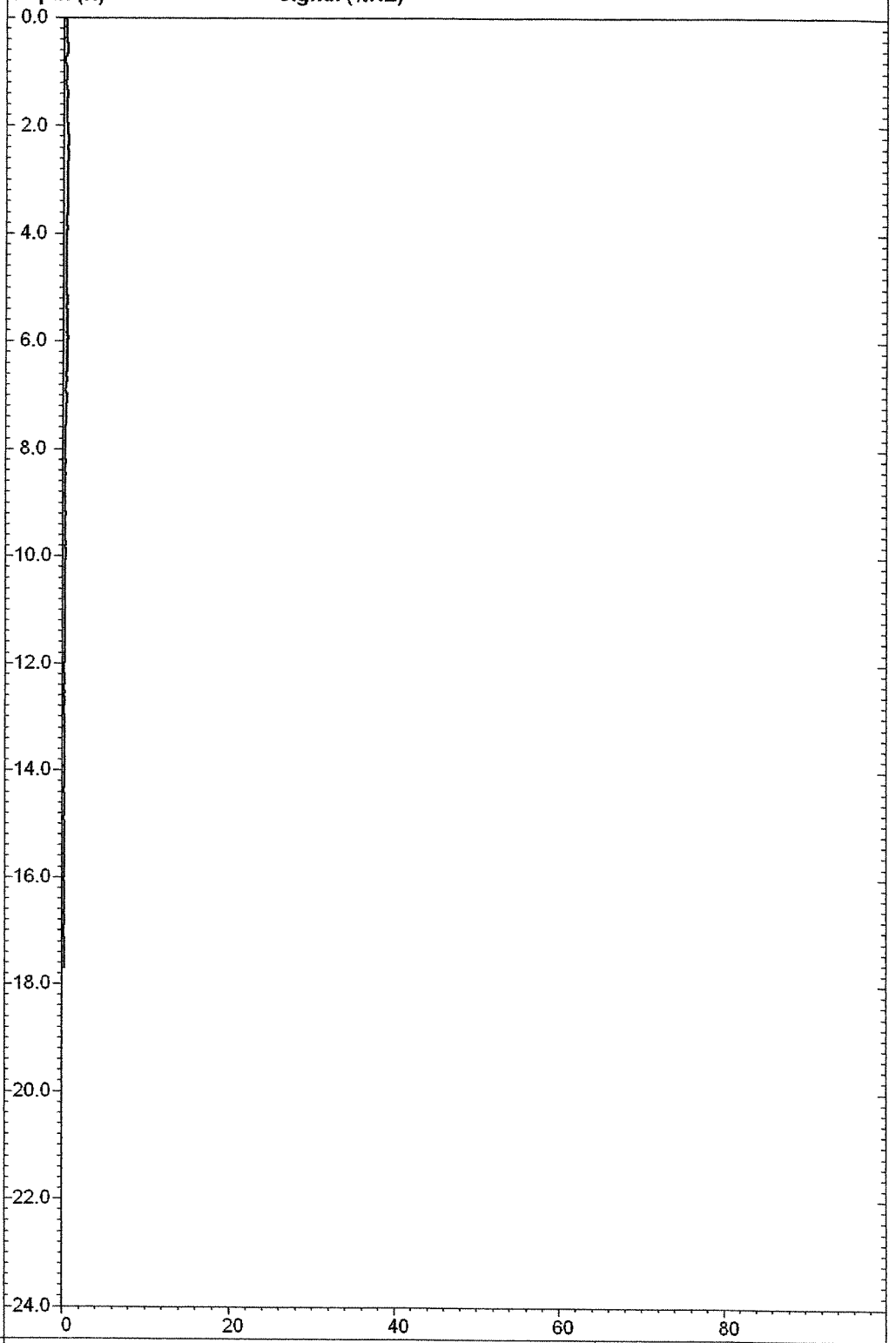
LIF37

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.93 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **1.5 % @ 1.16 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 11:38:15 AM**

Call outs	Depth (ft) Signal (%RE)



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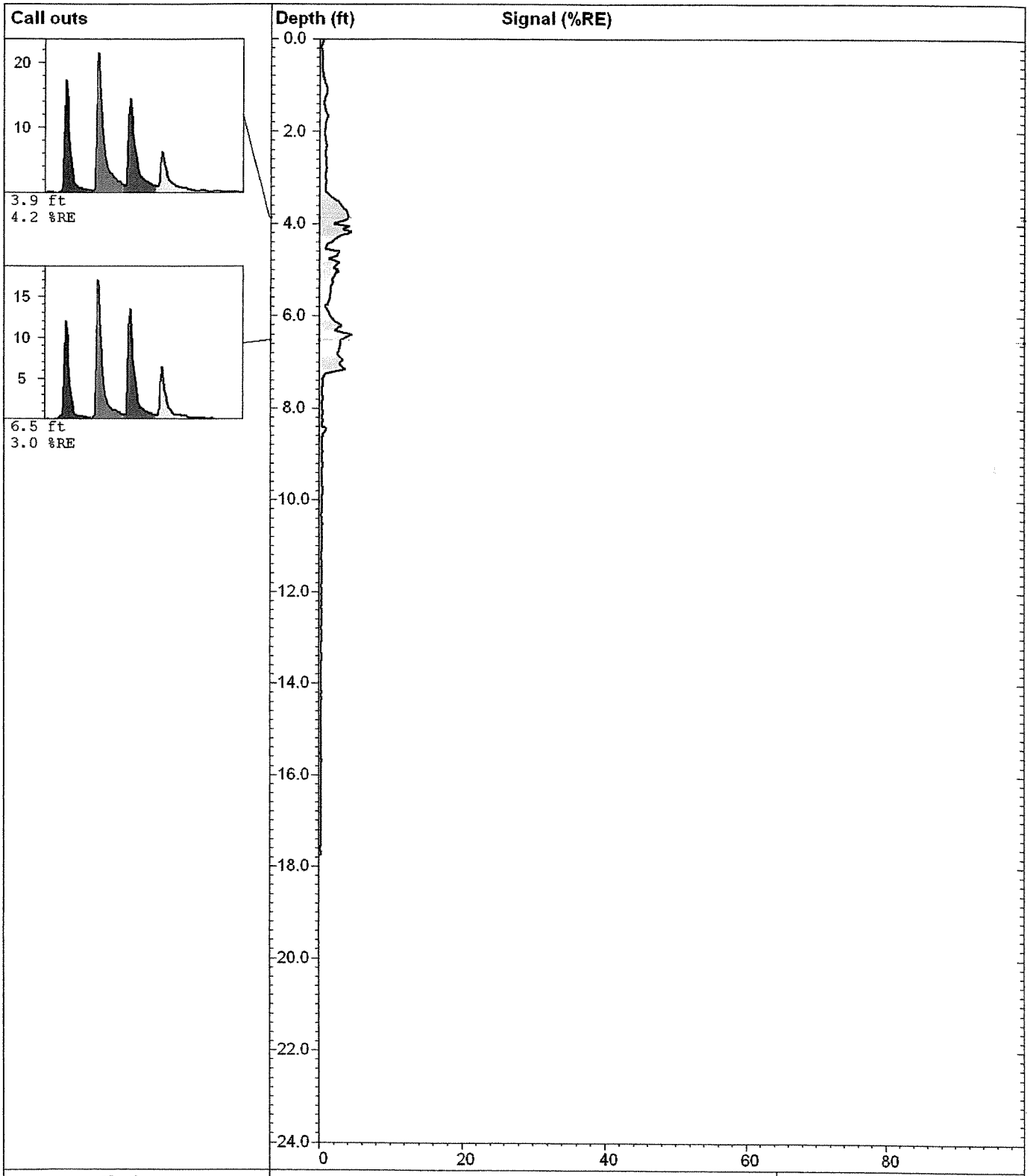
LIF38

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.71 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **0.6 % @ 2.55 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 12:08:57 PM**



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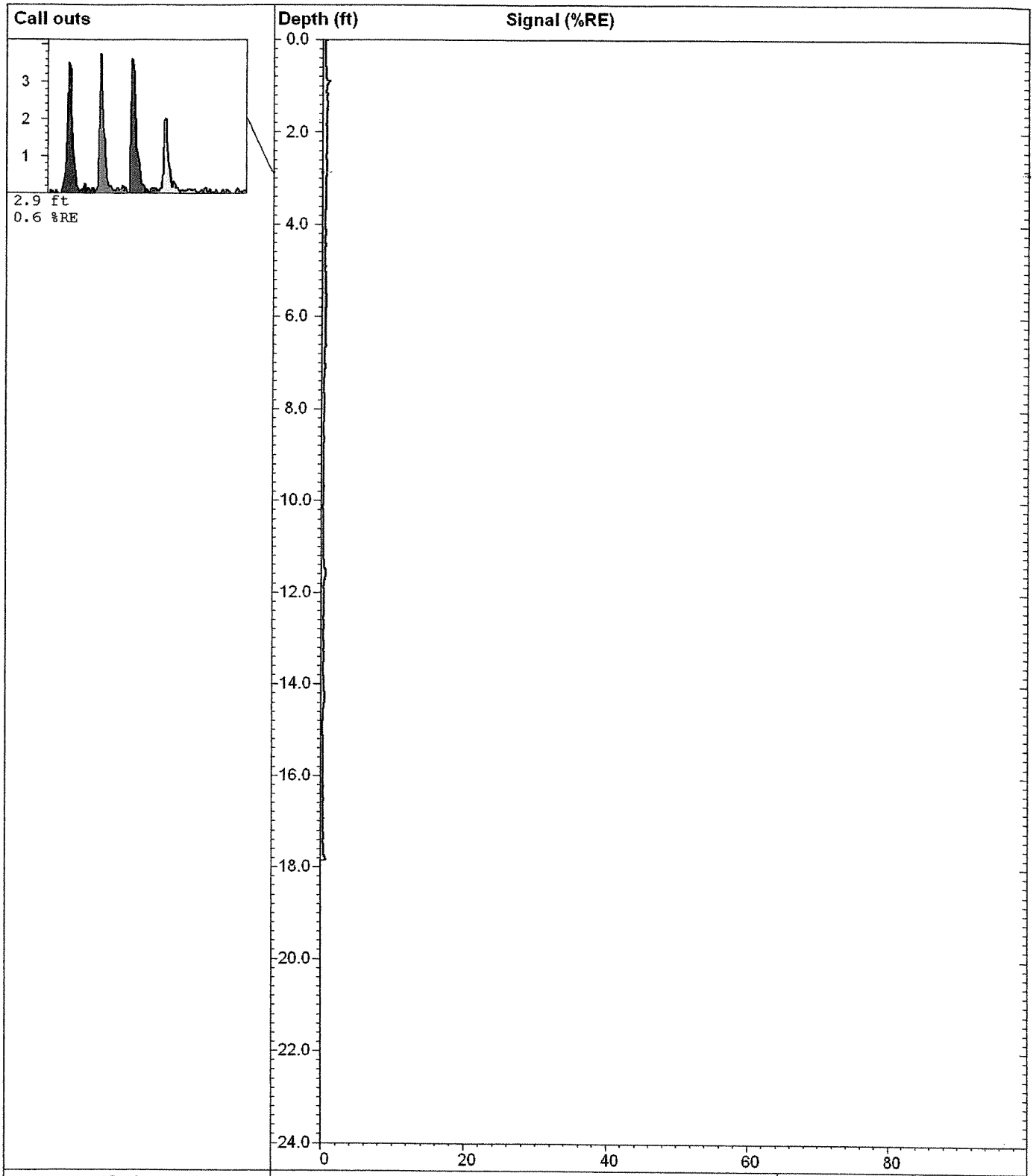
LIF39

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.77 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **4.6 % @ 6.40 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 12:26:10 PM**



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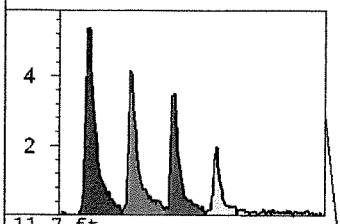
LIF40

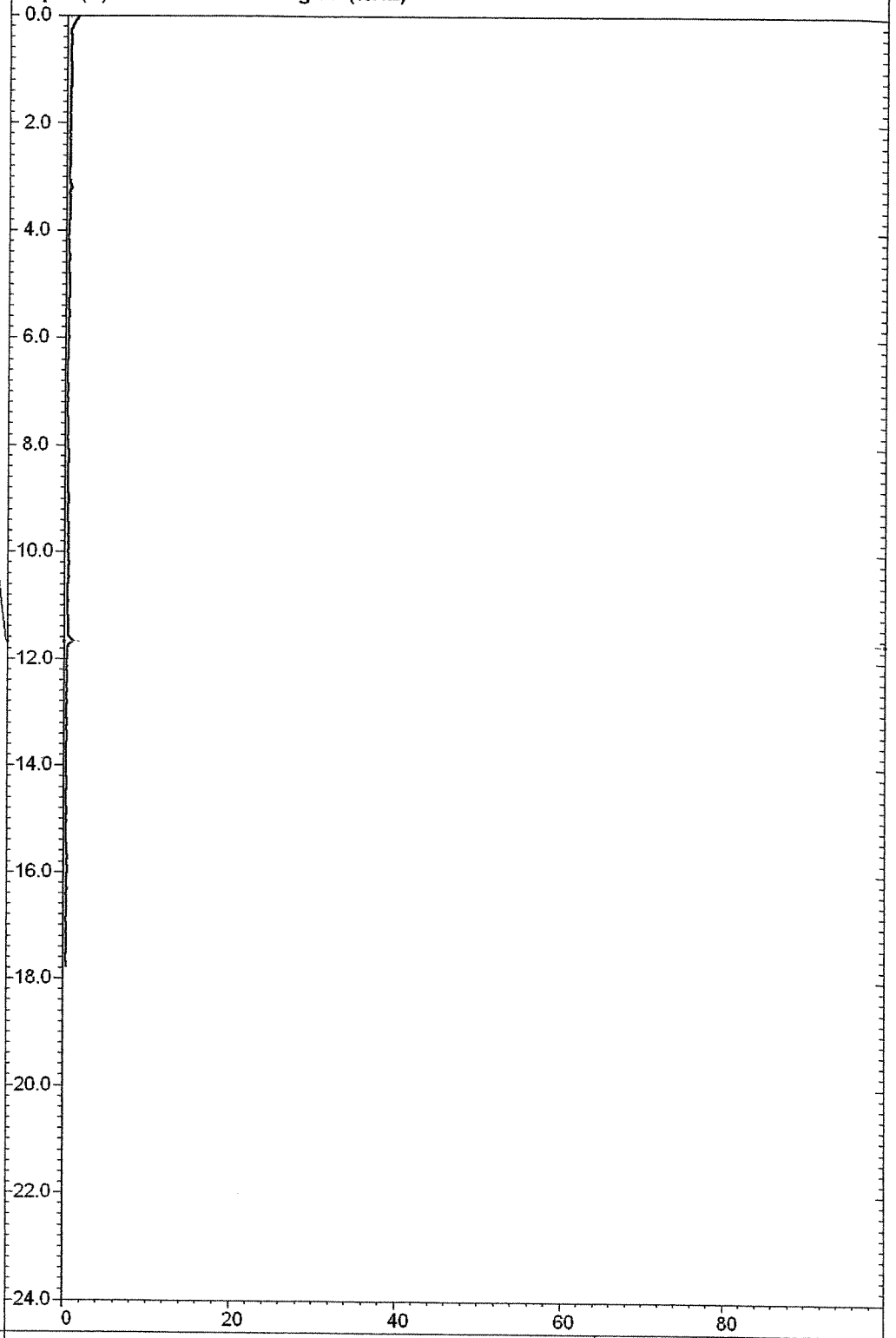
UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.87 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **1.1 % @ 0.89 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 12:40:37 PM**

Call outs



11.7 ft
1.1 %RE



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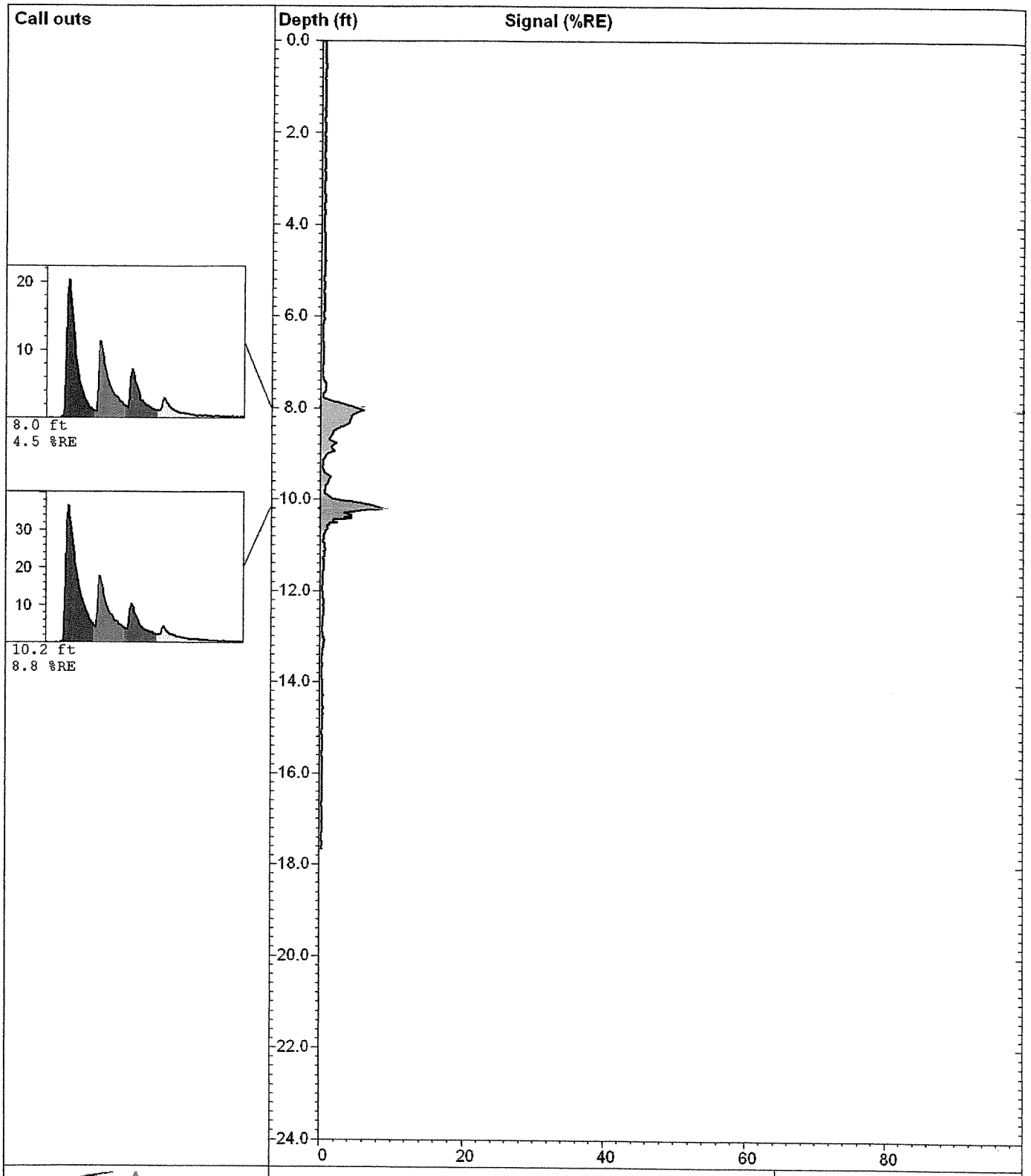
LIF41

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.80 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **1.4 % @ 0.00 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 2:03:29 PM**



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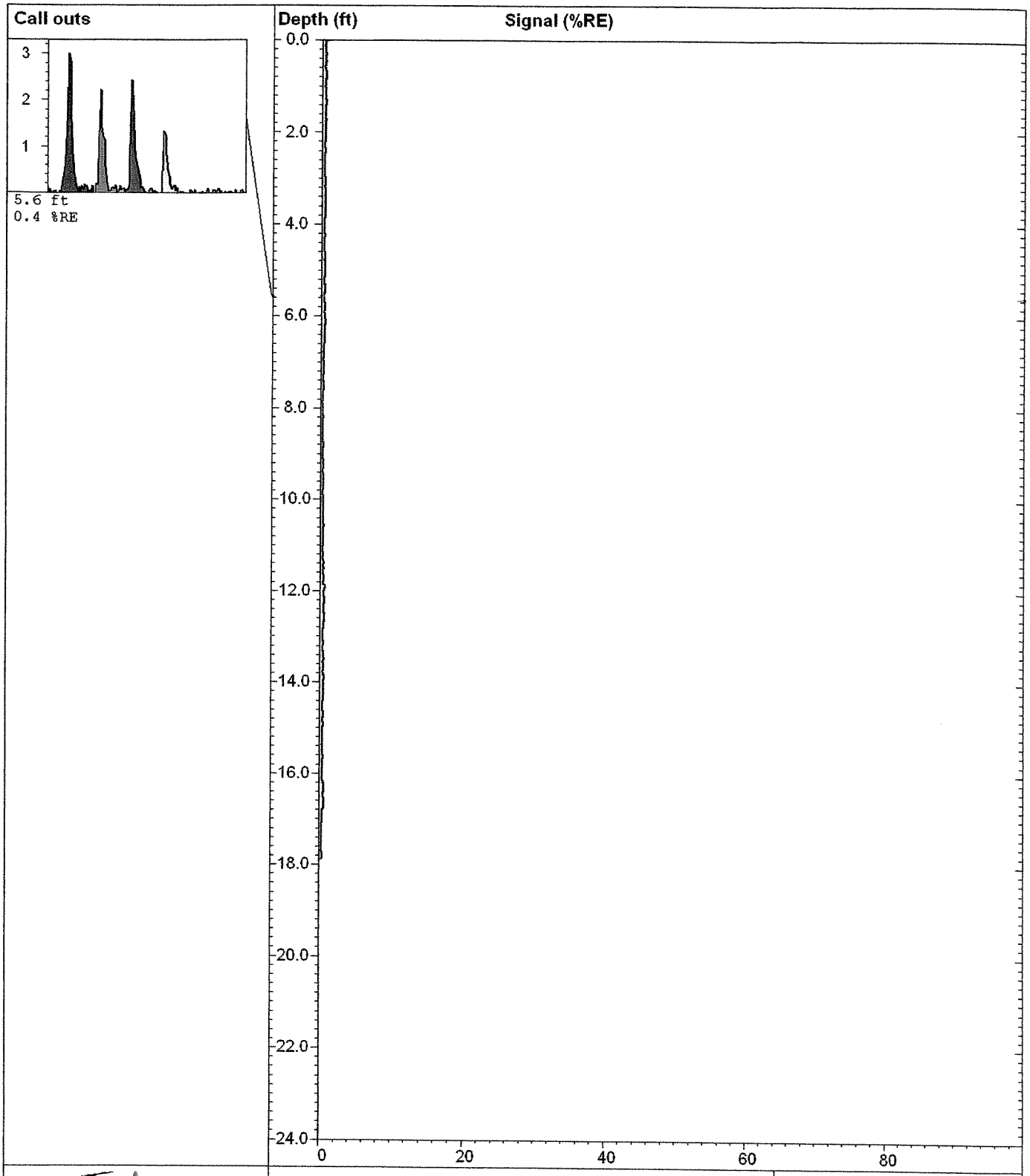
LIF42

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.68 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **8.8 % @ 10.19 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 2:20:16 PM**



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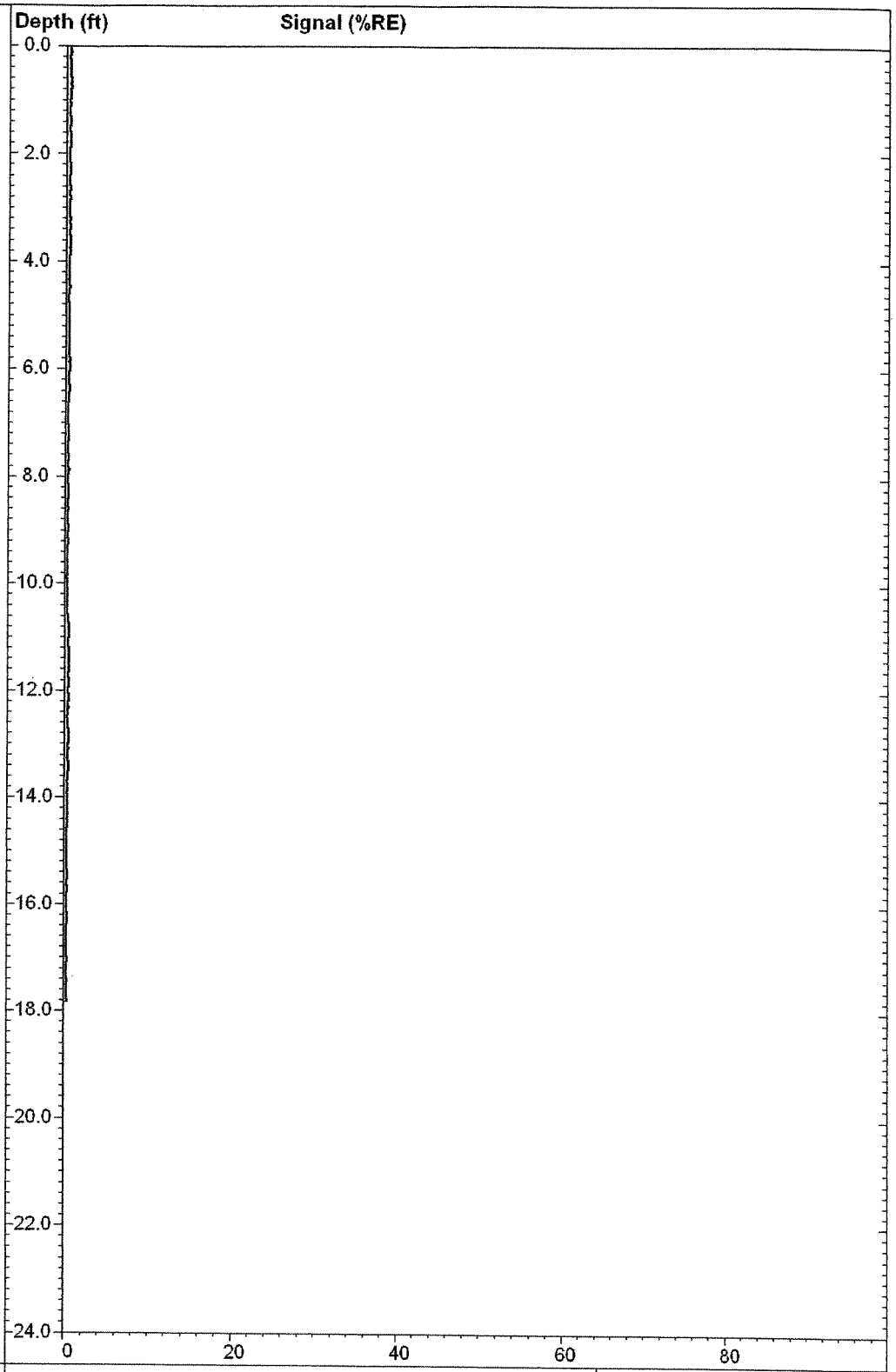
LIF43

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.89 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **0.8 % @ 0.00 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 2:43:03 PM**

Call outs



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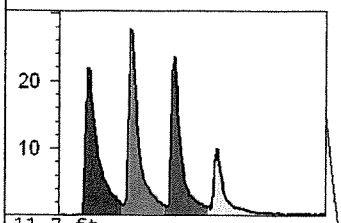
LIF44

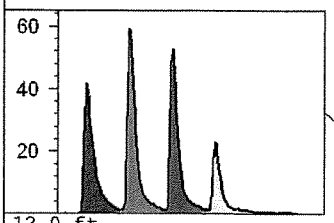
UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.84 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **0.6 % @ 0.77 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 3:02:27 PM**

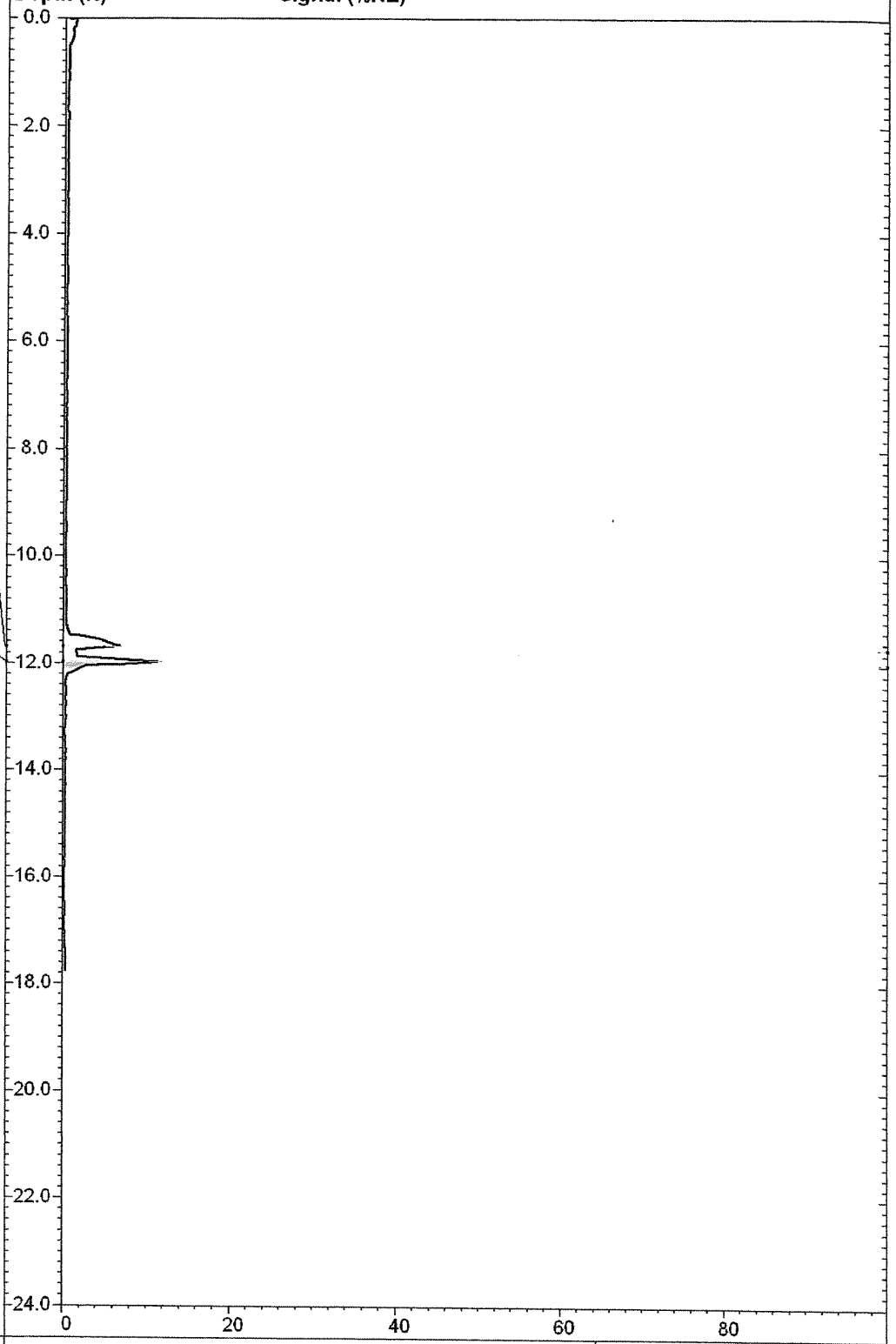
Call outs



11.7 ft
6.8 %RE



12.0 ft
11.7 %RE



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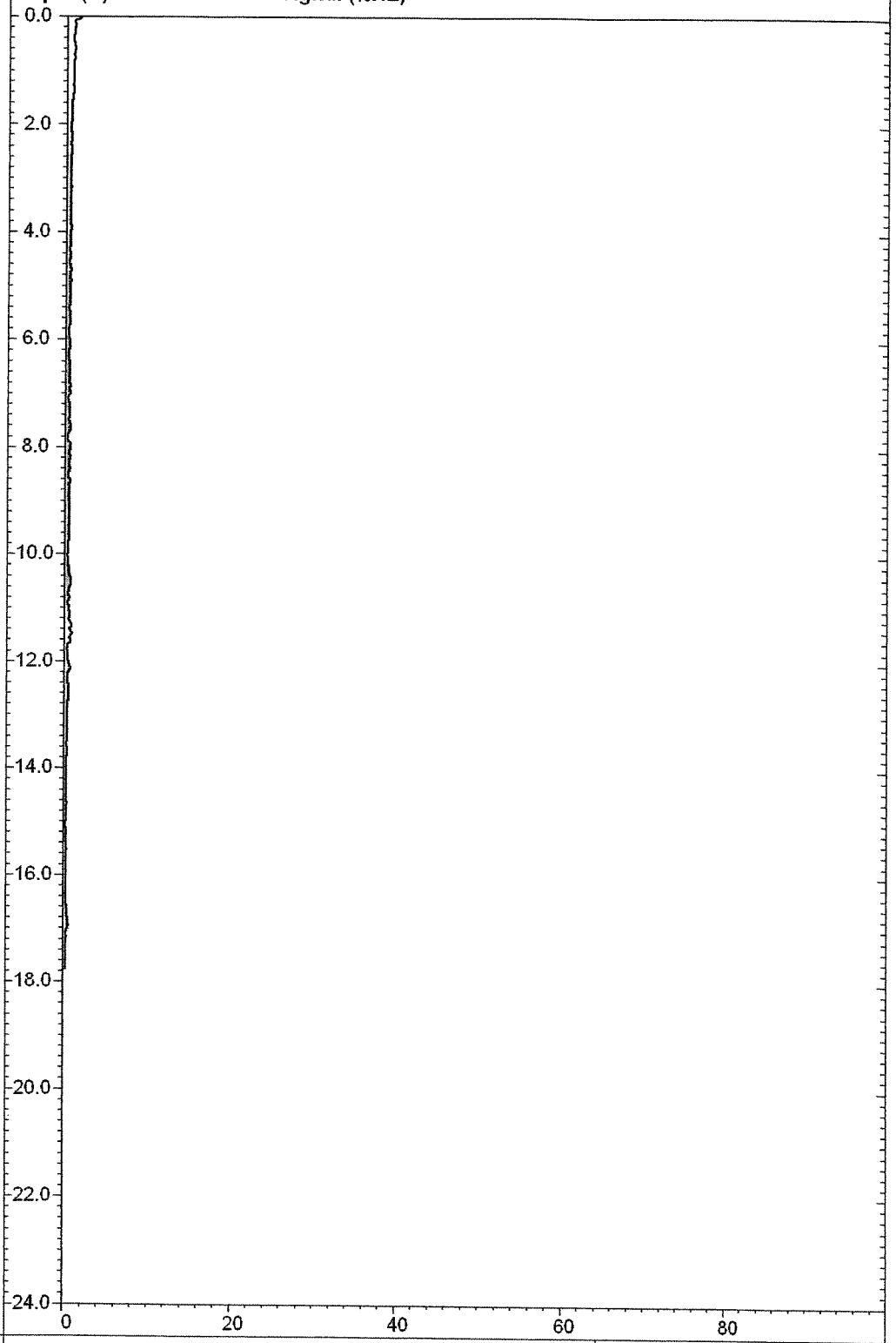
LIF45		**UVOST**
Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.79 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **11.7 % @ 11.97 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 3:19:23 PM**

Call outs



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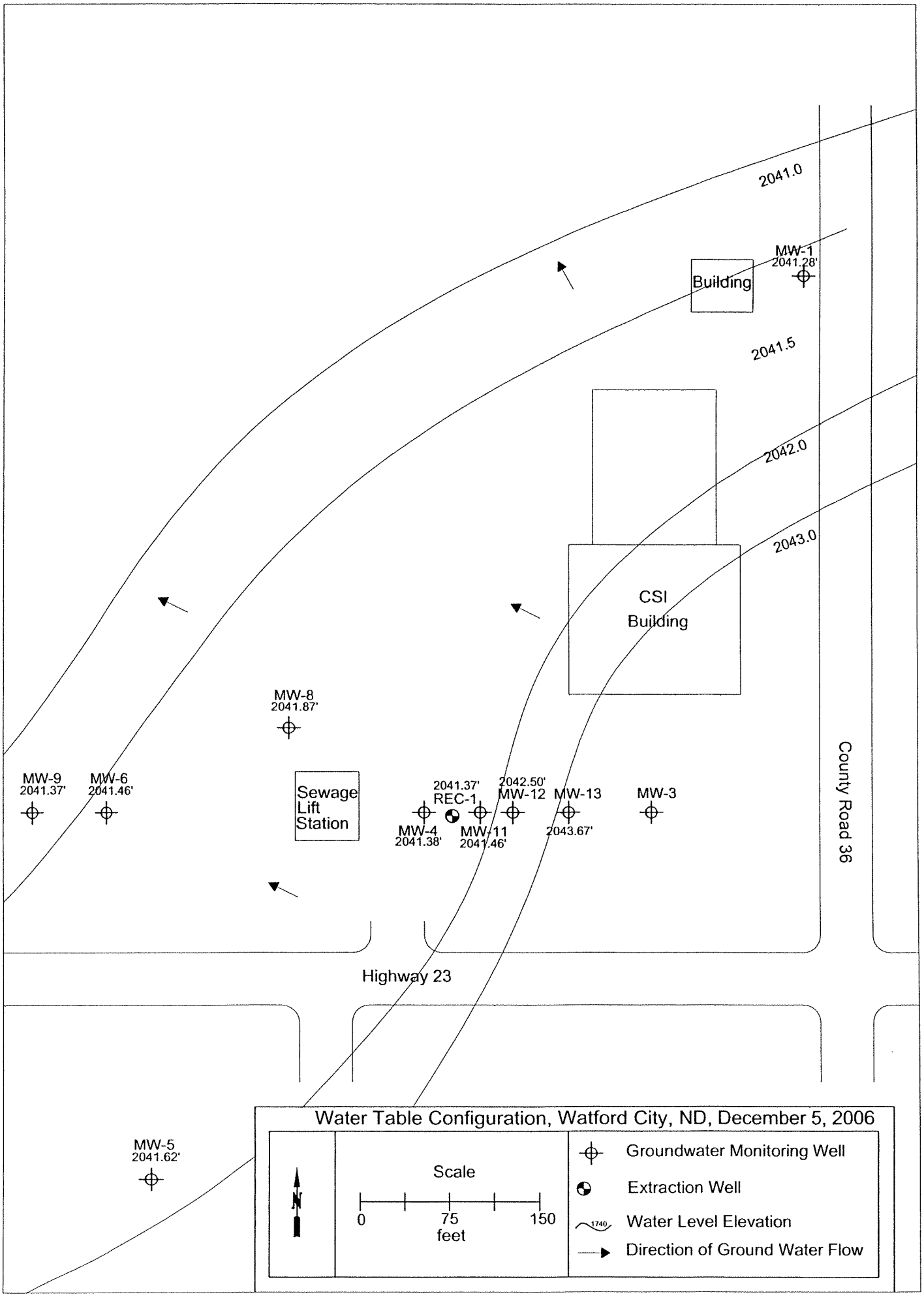
LIF46

UVOST

Site: **Watford City**	*Latitude / System:* **Unavailable / NAD83**	*Final depth:* **17.78 ft**
Client: **EERC**	*Longitude:* **Unavailable**	*Max signal:* **1.8 % @ 0.01 ft**
Job:	*Operator/Unit:* **T.Olsonawski/DTI02**	*Date & Time:* **11/7/2006 3:33:47 PM**

APPENDIX C

GROUNDWATER TABLE MONITORING


2041.0
2041.5
2042.0
2043.0
MW-1
2041.28'
Building
CSI
Building
MW-8
2041.87'
MW-9
2041.37'
MW-6
2041.46'
Sewage
Lift
Station
2041.37'
REC-1
2042.50'
MW-12
MW-13
MW-3
MW-4
2041.38'
MW-11
2041.46'
2043.67'
County Road 36
Highway 23
MW-5
2041.62'
Water Table Configuration, Watford City, ND, December 5, 2006
N
Scale
0
75
150
feet
Groundwater Monitoring Well
Extraction Well
1740
Water Level Elevation
Direction of Ground Water Flow

Water Table Monitoring

Depth to water in ft from TOC

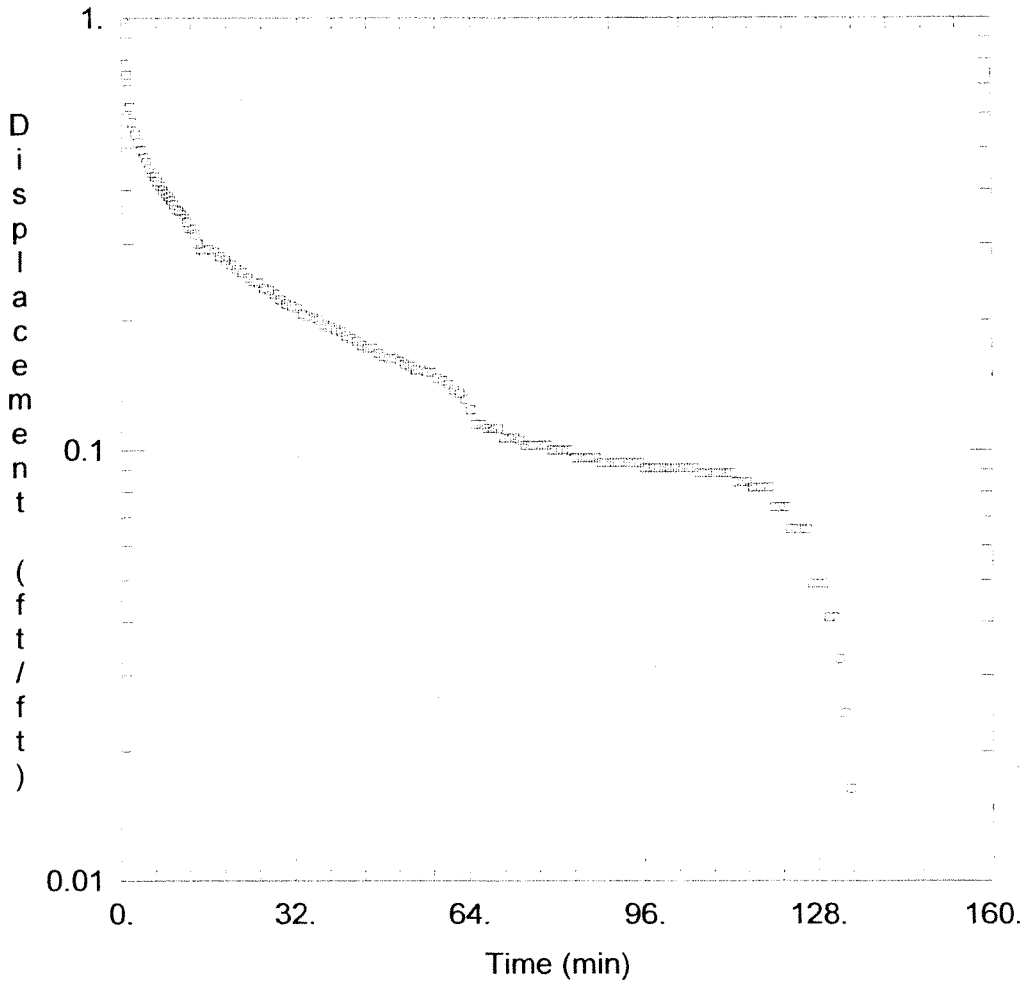
Well ID	TOC elevation	12/12/2005	4/10/2006	5/25/2006	12/5/2006
REC-1	2052.92	11.71	11.35	11.26	11.55
MW-1	2056.40	15.22	14.40	15.02	15.12
MW-3*	2053.62	8.68	NA	NA	NA
MW-4 water	2055.01	14.56	14.35	13.13	13.77
MW-4 product		13.58	13.67	-	13.58
MW-5	2054.27	NM	NM	12.28	12.65
MW-6	2053.39	12.30	11.10	11.95	11.93
MW-8	2054.59	13.22	12.01	12.91	12.72
MW-9	2054.85	13.65	12.49	13.40	13.48
MW-11 water	2054.97	13.80	13.39	13.32	13.51
MW-11 product		Trace	Trace	-	HC Odor
MW-12 water	2053.33	12.81	11.11	10.40	10.91
MW-12 product		12.61	10.95	-	10.81
MW-13	2053.35	9.74	10.56	9.82	9.68

*NA = Not Applicable - leaking well head at damaged old well

NM = Not Measured

APPENDIX D

RESULTS OF HYDRAULIC TESTING



SLUG TEST (SLUG REMOVAL)

Data Set: C:\Barry Files\IRT\Watford City\Watford Slug Test\Slug Out full data.aqt
Date: 04/03/07 Time: 10:20:32

PROJECT INFORMATION

Company: EERC
Client: NDDH
Project: Watford City
Location: North Dakota
Test Well: REC-1
Test Date: 12-5-2006

AQUIFER DATA

Saturated Thickness: 1.5 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (REC-1)

Initial Displacement: -1.22 ft
Total Well Penetration Depth: 6.9 ft
Casing Radius: 0.17 ft
Static Water Column Height: 6.9 ft
Screen Length: 10. ft
Wellbore Radius: 0.45 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 6.412E-5 ft/min
v0 = -0.5882 ft

Data Set: C:\Barry Files\IRT\Watford City\Watford Slug Test\Slug Out full data.aqt
Title: Slug Test (Slug Removal)
Date: 04/03/07
Time: 10:20:52

PROJECT INFORMATION

Company: EERC
Client: NDDH
Project: Watford City
Location: North Dakota
Test Date: 12-5-2006
Test Well: REC-1

AQUIFER DATA

Saturated Thickness: 1.5 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: : REC-1

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: -1.22 ft
Static Water Column Height: 6.9 ft
Casing Radius: 0.17 ft
Wellbore Radius: 0.45 ft
Well Skin Radius: 0.6 ft
Screen Length: 10. ft
Total Well Penetration Depth: 6.9 ft

No. of Observations: 151

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.	0.	61.	-0.168
0.5	-1.214	62.	-0.1651
1.	-0.9014	63.	-0.1595
1.5	-0.7606	64.	-0.151
2.	-0.6986	65.	-0.14
2.5	-0.6564	66.	-0.14
3.	-0.6282	67.	-0.137
3.5	-0.6028	68.	-0.137
4.	-0.5803	69.	-0.137
4.5	-0.5662	70.	-0.13
5.	-0.5465	71.	-0.13
5.5	-0.5352	72.	-0.13
6.	-0.524	73.	-0.1285
6.5	-0.5099	74.	-0.125
7.	-0.4986	75.	-0.125
7.5	-0.4873	76.	-0.125

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
8.	-0.4789	77.	-0.125
8.5	-0.4704	78.	-0.125
9.	-0.462	79.	-0.122
9.5	-0.4507	80.	-0.122
10.	-0.4395	81.	-0.122
10.5	-0.4366	82.	-0.122
11.	-0.4282	83.	-0.117
11.5	-0.4197	84.	-0.117
12.	-0.4113	85.	-0.117
12.5	-0.3972	86.	-0.117
13.	-0.3972	87.	-0.117
13.5	-0.3859	88.	-0.114
14.	-0.3662	89.	-0.114
14.5	-0.355	90.	-0.114
15.	-0.3521	91.	-0.114
16.	-0.356	92.	-0.114
17.	-0.351	93.	-0.114
18.	-0.342	94.	-0.114
19.	-0.336	95.	-0.114
20.	-0.328	96.	-0.111
21.	-0.32	97.	-0.111
22.	-0.314	98.	-0.111
23.	-0.305	99.	-0.111
24.	-0.3	100.	-0.111
25.	-0.2975	101.	-0.111
26.	-0.289	102.	-0.111
27.	-0.2862	103.	-0.111
28.	-0.28	104.	-0.111
29.	-0.272	105.	-0.111
30.	-0.266	106.	-0.108
31.	-0.263	107.	-0.108
32.	-0.26	108.	-0.108
33.	-0.252	109.	-0.108
34.	-0.249	110.	-0.108
35.	-0.2468	111.	-0.108
36.	-0.244	112.	-0.108
37.	-0.238	113.	-0.103
38.	-0.235	114.	-0.103
39.	-0.232	115.	-0.103
40.	-0.229	116.	-0.1
41.	-0.224	117.	-0.1
42.	-0.221	118.	-0.1
43.	-0.218	119.	-0.1
44.	-0.213	120.	-0.09
45.	-0.21	121.	-0.09
46.	-0.21	122.	-0.09
47.	-0.2045	123.	-0.08
48.	-0.201	124.	-0.08
49.	-0.1989	125.	-0.08
50.	-0.1989	126.	-0.08
51.	-0.196	127.	-0.06
52.	-0.193	128.	-0.06
53.	-0.1905	129.	-0.06

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
54.	-0.187	130.	-0.05
55.	-0.187	131.	-0.05
56.	-0.1848	132.	-0.04
57.	-0.1848	133.	-0.03
58.	-0.179	134.	-0.02
59.	-0.1764	135.	-0.01
60.	-0.173		

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
Shape Factor: 2.08

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	6.439E-5	ft/min
y0	-0.5888	ft

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
K	6.412E-5	3.755E-6	ft/min
y0	-0.5882	0.01936	ft

Parameter Correlations

	K	y0
K	1.00	-0.66
y0	-0.66	1.00

Residual Statistics

for weighted residuals

Sum of Squares .. 1.097 ft^2
Variance ..... 0.007365 ft^2
Std. Deviation..... 0.08582 ft
Mean..... -0.00744 ft
No. of Residuals .. 151
No. of Estimates .. 2

Will locates be done, do we have permission to drill in all quadrants?

Do businesses on-site know that we're coming?

Meet drillers at what time and where, names, phone numbers of drillers.

Location of wells? Number of wells? Type of wells (still 1 4" and 4 2"?)

What is mission? If delineation, then spread wells out to sides. If to prepare for hydro test, then that's another matter. It's tough to focus on both, you may get incidental results by shooting for hydro focus.

How deep into the water table do you need the wells for hydro test? How much screen above/below water table?
Completion of wells.

> Assuming groundwater is at 20 feet (average around site), what length of screen for each type of well and where do you want the water level to fall (what is the target interval)?
>
> Also, are we using standard completion methods: sand to two feet over screen then bentonite chips to surface? Then a flush mount? Will they be locked?
>
> Are other wells existing on-site locked, if so can I get the keys to take water levels?

Are we sampling on the way down? If so, what kind, split spoons or simply from auger flights? Is it just baggie/PID sampling? If we are sampling with split spoons, what interval (continuous/ every 5-feet)? Do drillers have DECON equipment for spoons/augers?

If collecting samples for lab, get bottle requirements and all lab information.

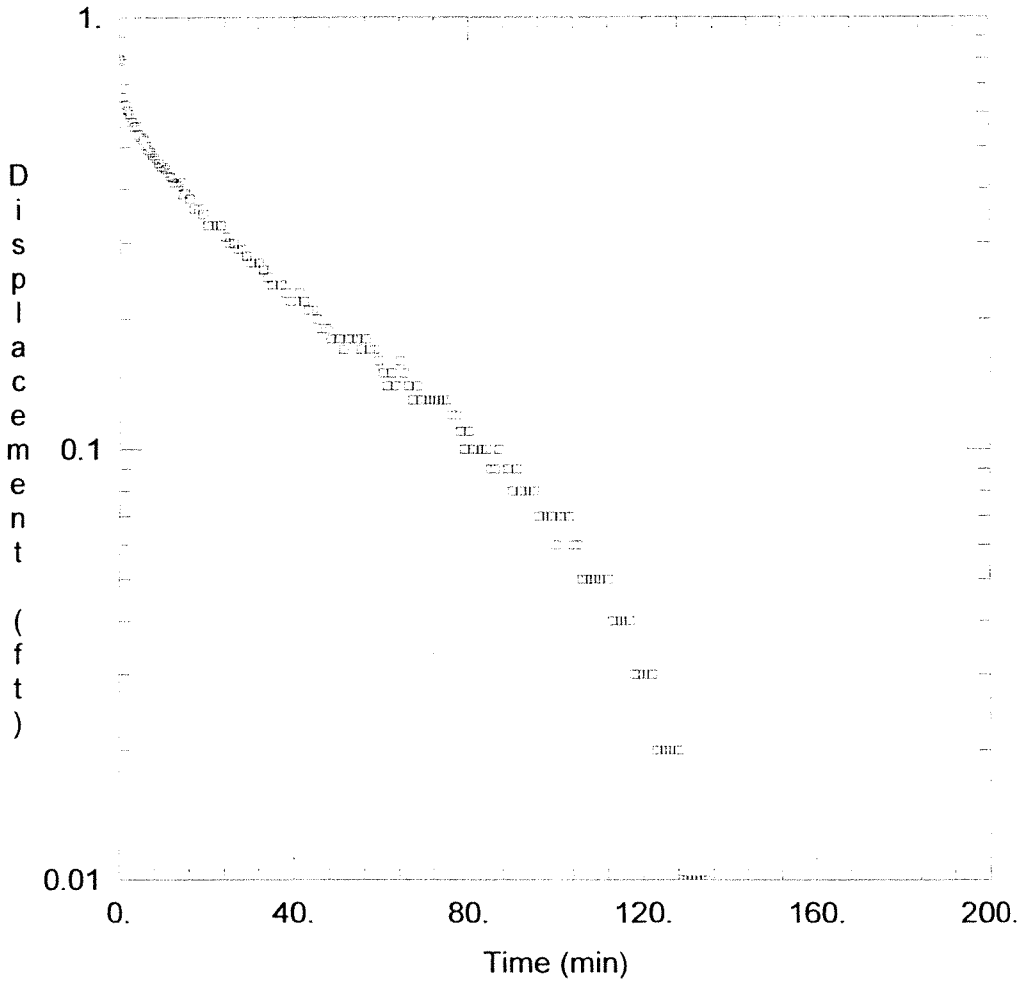
Take 40-hour refresher.

Make reservation at Raddison, get truck reserved.

5- METHANE CYLINDERS
PAT CAMPBELL (ENCARL)
- CANISTER (BOMB)
- TEDLAR BAGS
BILL BROWN
$40.00

EQUIPMENT
Drill logs
Rubber gloves
Digital Camera
PID Calibration gas
Baggies
Hard hat
Safety Glasses
Markers/Pens/pencils
Field Book
Work boots
Water level indicator/ Product indicator
Decon stuff??
Soil classification information from AK.
Munsel Soil color Book
Copies of all previous work and workplans
Copy of drill permit that Jarda was talking about.

FIGURE 1
- N. ARROW
- SCALE



SLUG TEST (SLUG IN)

Data Set: C:\Barry Files\IRT\Watford City\Watford Slug Test\Aqtw2.aqt
Date: 04/02/07 Time: 12:36:39

PROJECT INFORMATION

Company: EERC
Client: NDDH
Project: Watford City
Location: North Dakota
Test Well: REC-1
Test Date: 12-5-2006

AQUIFER DATA

Saturated Thickness: 0.5 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (REC-1)

Initial Displacement: 0.8 ft Static Water Column Height: 6.9 ft
Total Well Penetration Depth: 6.9 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Wellbore Radius: 0.45 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 6.701E-5 ft/min y0 = 0.5623 ft

Data Set: C:\Barry Files\IRT\Watford City\Watford Slug Test\Aqtw2.aqt
Title: Slug Test (Slug In)
Date: 04/02/07
Time: 12:37:04

PROJECT INFORMATION

Company: EERC
Client: NDDH
Project: Watford City
Location: North Dakota
Test Date: 12-5-2006
Test Well: REC-1

AQUIFER DATA

Saturated Thickness: 0.5 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: : REC-1

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 0.8 ft
Static Water Column Height: 6.9 ft
Casing Radius: 0.17 ft
Wellbore Radius: 0.45 ft
Well Skin Radius: 0.6 ft
Screen Length: 10. ft
Total Well Penetration Depth: 6.9 ft

No. of Observations: 150

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.	0.	60.	0.15
0.5	0.7943	61.	0.14
1.	0.6535	62.	0.15
1.5	0.6281	63.	0.14
2.	0.6084	64.	0.16
2.5	0.5971	65.	0.15
3.	0.5718	66.	0.14
3.5	0.5577	67.	0.13
4.	0.5605	68.	0.14
4.5	0.5352	69.	0.13
5.	0.5267	70.	0.13
5.5	0.5211	71.	0.13
6.	0.5042	72.	0.13
6.5	0.4929	73.	0.13
7.	0.4873	74.	0.13
7.5	0.4788	75.	0.13

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
8.	0.4732	76.	0.12
8.5	0.4676	77.	0.12
9.	0.4591	78.	0.11
9.5	0.4507	79.	0.1
10.	0.4507	80.	0.11
10.5	0.445	81.	0.1
11.	0.4366	82.	0.1
11.5	0.4281	83.	0.1
12.	0.4253	84.	0.1
12.5	0.4141	85.	0.09
13.	0.4141	86.	0.09
13.5	0.4084	87.	0.1
14.	0.4141	89.	0.09
14.5	0.3887	90.	0.08
15.	0.3915	91.	0.09
16.	0.38	92.	0.08
17.	0.36	93.	0.08
18.	0.36	94.	0.08
19.	0.35	95.	0.08
20.	0.33	96.	0.07
21.	0.33	97.	0.07
22.	0.33	98.	0.07
23.	0.33	99.	0.07
24.	0.31	100.	0.06
25.	0.3	101.	0.07
26.	0.299	102.	0.07
27.	0.29	103.	0.07
28.	0.29	104.	0.06
29.	0.28	105.	0.06
30.	0.27	106.	0.05
31.	0.27	107.	0.05
32.	0.27	108.	0.05
33.	0.26	109.	0.05
34.	0.25	110.	0.05
35.	0.24	111.	0.05
36.	0.24	112.	0.05
37.	0.24	113.	0.04
38.	0.23	114.	0.04
39.	0.22	115.	0.04
40.	0.22	116.	0.04
41.	0.23	117.	0.04
42.	0.22	118.	0.03
43.	0.21	119.	0.03
44.	0.21	120.	0.03
45.	0.2	121.	0.03
46.	0.19	122.	0.03
47.	0.19	123.	0.02
48.	0.18	124.	0.02
49.	0.18	125.	0.02
50.	0.18	126.	0.02
51.	0.17	127.	0.02
52.	0.18	128.	0.02
53.	0.18	129.	0.01

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
54.	0.18	130.	0.01
55.	0.17	131.	0.01
56.	0.18	132.	0.01
57.	0.17	133.	0.01
58.	0.17	134.	0.01
59.	0.16	135.	0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
Shape Factor: 2.08

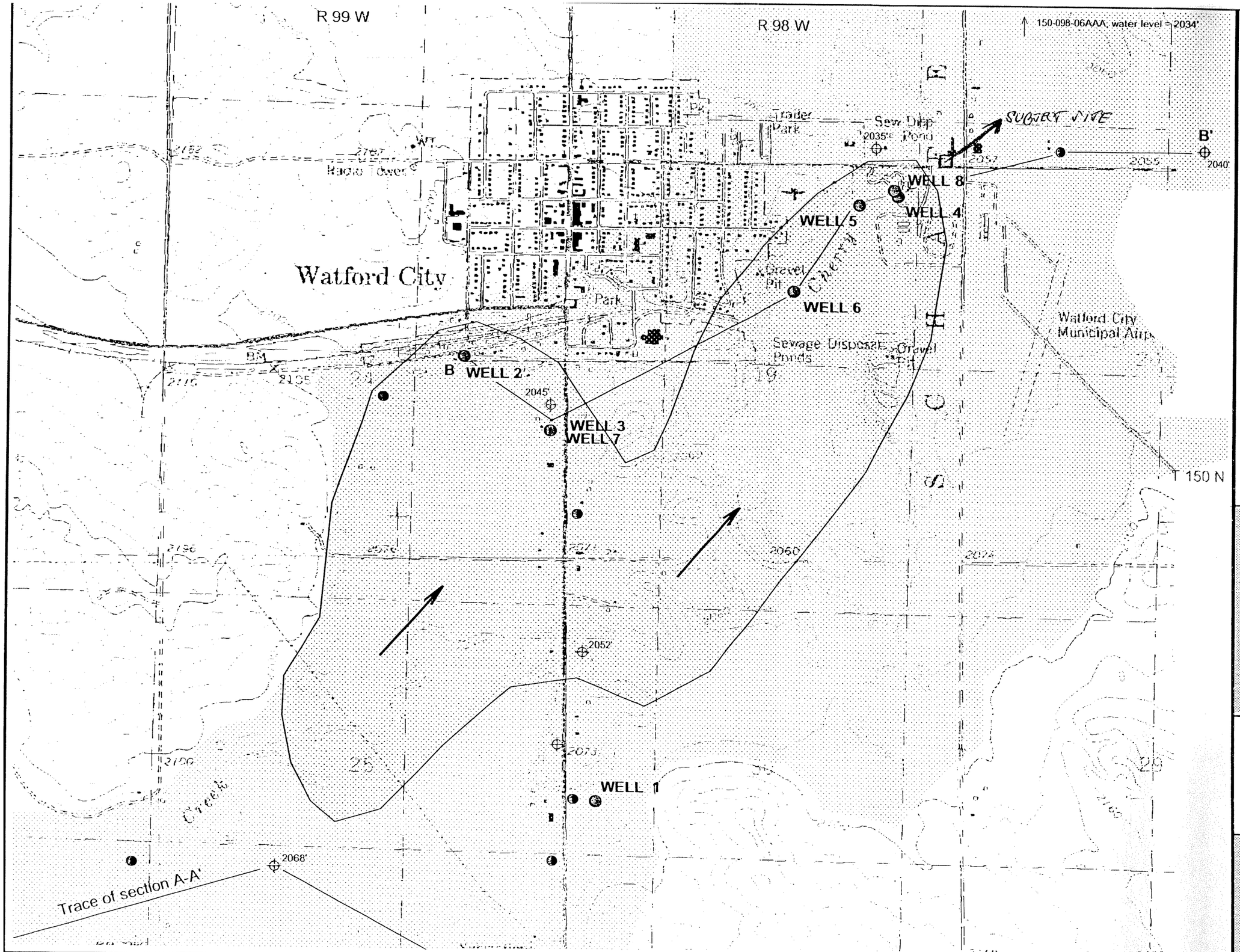
VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	6.701E-5	ft/min
y0	0.5623	ft

APPENDIX E

WELLHEAD PROTECTION AREA



EXPLANATION

- Wellhead Protection Area
- Municipal Well
- Test Hole
- Observation Well
- Direction of ground-water movement
- Area underlain by Tobacco Garden aquifer
- 2045' Water levels measured 8/1/06

N W E S

400 0 400 800 1200 Feet

Scale: 1" = 1,230 feet
Contour interval = 20 feet

Figure 2

CITY OF WATFORD CITY WELLHEAD PROTECTION AREA

(Revised September 2006)

McKenzie County, North Dakota

Notes: Base map from Watford City (1978), ND, 7.5' Series topographic quadrangle.

B — B' Section B - B' shown on Figure 7.

North Dakota Department of Health
Division of Water Quality
September 2006

09/28/2006 JRH

APPENDIX F

SUMMARY OF ANALYTICAL DATA

SUMMARY TABLE FOR BTEX AND SELECTED BIODEGRADATION INDICATORS

		MW-1 12/12/05	MW-1 12/06/06	MW-3* 12/12/05	MW-4 12/12/05	MW-5 12/06/06	MW-6 12/12/05	MW-6 12/06/06	MW-8 12/12/05	MW-8 12/6/06/	MW-9 12/12/05	MW-9 12/06/06	MW-11 12/12/05	MW-11 12/06/06
MTBE	ppb	<1	<0.6	<20	FP	<0.6	<1	<0.6	<1	<0.6	<1	<0.6	<500	<600
Benzene	ppb	2.7	<0.5	1,643		<0.5	44	39.9	<1	<0.5	<1	<0.5	28290	18790
Toluene	ppb	<1	<0.6	49.1		<0.6	<1	<0.6	<1	<0.6	<1	<0.6	1305	1008
Ethyl Benzene	ppb	<1	<0.6	178.4		<0.6	4.4	7.1	<1	<0.6	<1	<0.6	2263	2125
Xylenes Total)	ppb	<3	<3	428.3		<3	<3	4.4	<3	<3	<3	<3	2606	2534
GRO (TPH)	mg/l	<0.2	<0.2	4.977		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	68.9	53.7
Sulfate	mg/l	10900	8500			2390	966	988	12900	13200	1400	1490	6700	5800
Nitrate-Nitrite as N	mg/l	2.77	0.18			<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Ammonia-Nitrogen as N	mg/l	<0.1	<0.1			0.79	0.84	0.89	0.11	0.11	1.69	1.64	1.5	1.4
Phosphorus P (total)	mg/l	0.43	0.16			<0.1	0.2	<0.1	1.65	<0.1	0.31	<0.1	1.6	0.53
COD	mg/l	24.2	63.6			13.3	16	42.5	13	63.6	26.4	29.5	410	458
BOD	mg/l	<2	<2			2.62	5.36	2.74	<2	<2	5.33	3.32	73.5	60
TOC	mg/l	27	27			8.4	6.5	6.4	26	27	8	6.4	136	162
Fe (total)	mg/l	28.7	37.4			20	21	28.1	60	24.2	970	26.9	57	30
Fe (dissolved)	mg/l	<0.1	<0.1			0.8	6.5	6.48	<0.1	<0.1	5.19	8.42	1.84	2.6
Mn (total)	mg/l	8.3	7.8			0.71	0.83	0.85	10.7	2.3	2.72	1.03	6.3	2.21
Mn (dissolved)	mg/l	<0.05	<0.05			0.38	0.84	0.73	0.2	0.1	0.96	0.95	4.58	2
DO	(mg/l)	6.15	3.01	3.60		0.98	3.90	0.55	3.30	5.20	1.84	1.19	FP trace	0.73
ORP	(mV)	117.0	224.9	42.5		111.6	-8.9	3.5	80.1	84.9	-3.7	-15.3		-39.5
EC	(µS/cm)	22609	14499	2522		5163	3769	3211	22327	18011	3847	3240		12618
pH		6.59	7.17	7.48		7.42	7.49	7.09	6.98	7.16	7.46	7.33		7.13
Temperature	(°C)	10.82	11.35	10.19		11.30	9.57	9.87	10.41	10.44	10.74	10.6		10.4

COD - Chemical Oxygen Demand
BOD - Biological Oxygen Demand
TOC - Total Organic Carbon
DO - Dissolved Oxygen
ORP - Oxidation/Reduction Potential
EC - Electrical Conductivity
NM - Not Measured
FP - Free Product - samples were not collected form wells with FP, YSI probe was not used in wells with FP or FP sheen
*Old well MW-3 is impacted by leaking surface water, analytical data are strongly influenced by the fluctuating water in the casing

SUMMARY TABLE FOR BTEX AND SELECTED BIODEGRADATION INDICATORS (Continued)

		MW-12	MW-13	MW-13	REC-1	REC-1	Cherry C.	City Well #8
		12/12/05	12/12/05	12/06/06	12/12/05	12/06/05	12/06/05	12/06/06
MTBE	ppb	FP	<500	<600	<500	<600	<0.6	<0.6
Benzene	ppb		11420	29370	23120	17800	<0.5	<0.5
Toluene	ppb		5678	4430	1481	862.9	<0.6	<0.6
Ethyl Benzene	ppb		1763	3814	2127	3206	<0.6	<0.6
Xylenes Total)	ppb		5590	9538	2185	4054	<3	<3
GRO (TPH)	mg/l		93.14	112.7	69.55	65.63	<0.2	<0.2
Sulfate	mg/l		230	124	6200	7100	1160	517
Nitrate-Nitrite as N	mg/l		<0.1	0.11	<0.1	<0.1	<0.1	<0.1
Ammonia-Nitrogen as N	mg/l		0.1	0.22	1.01	1.06	<0.1	0.61
Phosphorus P (total)	mg/l		0.61	0.59	2.29	0.38	0.22	<0.1
COD	mg/l		169	270	NA	437	57.1	14.9
BOD	mg/l		89	120	NA	45.7	7.27	<2
TOC	mg/l		56	55	152	144	22	4.6
Fe (total)	mg/l		19.1	13	107	16.5	1.57	1.5
Fe (dissolved)	mg/l		0.56	<1	4.9	2.1	<0.1	1.38
Mn (total)	mg/l		0.97	0.76	6.3	1.63	0.18	0.1
Mn (dissolved)	mg/l		0.66	<0.5	2.71	1.8	<0.05	0.1
DO	(mg/l)		2.97	0.62	6.48	0.72	11.03	3.19
ORP	(mV)		52.8	13.0	-34.4	-39.8	216.8	69.6
EC	(µS/cm)		5095	3796	16549	15060	3235	1773
pH			7.62	7.31	8.18	7.11	8.29	7.75
Temperature	(°C)		10.29	10.51	10.29	10.18	0.35	8.69

COD - Chemical Oxygen Demand
BOD - Biological Oxygen Demand
TOC - Total Organic Carbon
DO - Dissolved Oxygen
ORP - Oxidation/Reduction Potential
EC - Electrical Conductivity
NM - Not Measured
FB - Field Blank
TB - Trip Blank
EQB - Equipment Blank

QA/QC		MW-3 D	FB	EQB	TB	FB	EQB	TB
		12/12/05	12/12/05	12/12/05	12/12/05	12/06/06	12/06/06	12/06/06
MTBE	ppb	<20	<1	<1	<1	<1	<1	<1
Benzene	ppb	2,557	<1	<1	<1	<1	<1	<1
Toluene	ppb	72.3	<1	<1	<1	<1	<1	<1
Ethyl Benzene	ppb	273	<1	<1	<1	<1	<1	<1
Xylenes Total)	ppb	680	<3	<3	<3	<3	<3	<3
GRO (TPH)	mg/l	7.014	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

FP - Free Product - samples were not collected form wells with FP, YSI probe was not used in wells with FP or FP sheen
Old well MW-3 is impacted by leaking surface water, analytical data are strongly influenced by the fluctuating water in the casing

COC CONCENTRATION

From VOC Analyses - December 6, 2006

Well ID	MTBE ppb	Benzene ppb	Toluene ppb	Ethylbenz. ppb	Xylenes (total) ppb	GRO (TPH) mg/l	DCA mg/l	MIK ug/l	Cumene ug/l	n-Propylbenzene ug/l	Naphthalene ug/l	Acetone ug/l	1,2,4-TMB ug/l
MW-1	<0.6	<0.5	<0.6	<0.6	<3	<0.2	<0.5						
MW-5	<0.6	<0.5	<0.6	<0.6	<3	<0.2	<0.5						
MW-6	<0.6	39.9	<0.6	7.1	4.4	<0.2	1.6	3.1	1.3	2	2.8		
MW-8	<0.6	<0.5	<0.6	<0.6	<3	<0.2	<0.5						
MW-9	<0.6	<0.5	<0.6	<0.6	<3	<0.2	<0.5						
MW-11	<600	18790	1008	2125	2534	53.7	2466						1232
MW-13	<600	29370	4430	3814	9538	112.7	1828						1674
REC-1	<600	17800	862.9	3206	4054	65.63	2095						1316
Cherry Cr.	<0.6	<0.5	<0.6	<0.6	<3	<0.2	<0.5					13.6	
City Well 8	<0.6	<0.5	<0.6	<0.6	<3	<0.2	<0.5						
MW-11 D	<600	21550	1125	2406	2840	82.22	2869						1899
FB	<1	<1	<1	<1	<3	<0.2	<0.5						
EQB	<1	<1	<1	<1	<3	<0.2	<0.5						
TB	<1	<1	<1	<1	<3	<0.2	<0.5						

MTBE	Methyl *tertiary*-butyl ether.
GRO	Gasoline Range Organics
DCA	1,2 Dichloroethane
MIK	Methyl Isobutyl Ketone
TMB	1,2,4-Trimethylbenzene

APPENDIX G

COMPLETE ANALYTICAL DOCUMENTATION

APPENDIX G-1

GROUNDWATER ANALYSES – COC

MINNESOTA VALLEY TESTING LABORATORIES, INC.
1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
1411 S. 12th St. ~ Bismarck, ND 58502 ~ 800-279-6885 ~ Fax 701-258-9724
35 W. Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com
MEMBER ACIL

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54130
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 8:45
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MW-1
W5630

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Chloroethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Chloromethane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
Bromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Dichlorodifluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Vinyl Chloride	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Methylene Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Trichlorofluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloroethane	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
trans-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Chloroform	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1,1-Trichloroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Carbon Tetrachloride	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Bromodichloromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichloropropane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
trans-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Trichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Chlorodibromomethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1,2-Trichloroethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
cis-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Bromoform	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,1,2,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Tetrachloroethene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Chlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Benzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Toluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Ethyl Benzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,3-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,4-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
cis-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,3-Dichloropropane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2,3-Trichloropropane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Allyl Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dibromoethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Methyl Ethyl Ketone	< 5	ug/L	5	SW8021 MDH 465F	13 Dec 06	DWR
Methyl Isobutyl Ketone	< 1.4	ug/L	1.4	SW8021 MDH 465F	13 Dec 06	DWR
Tetrahydrofuran	< 5	ug/L	5	SW8021 MDH 465F	13 Dec 06	DWR
m-Xylene and p-Xylene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
o-Xylene	< 0.3	ug/L	0.3	SW8021 MDH 465F	13 Dec 06	DWR

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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www.mvtl.com
MEMBER ACIL

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54130
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 8:45
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MW-1
W5630

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cumene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,1,1,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Dichlorofluoromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Trichlorotrifluoroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Ethyl Ether	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Acetone	< 10	ug/L	10	SW8021 MDH 465F	13 Dec 06	DWR
Dibromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
2,2-Dichloropropane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
Bromochloromethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Methyl tert-butyl Ether	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Styrene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
n-Propylbenzene	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Bromobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
2-Chlorotoluene	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
1,3,5-Trimethylbenzene	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
4-Chlorotoluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
t-Butylbenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2,4-Trimethylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
sec-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
p-Isopropyltoluene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
n-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dibromo-3-chloropropane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,2,4-Trichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Hexachlorobutadiene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Naphthalene	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,2,3-Trichlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
GRO (TPH)	< 0.2	mg/L	0.2	8015B/OA1	8 Dec 06	RDC

GC VOC Sample pH < 2

1-CHLORO-4-FLUOROBENZENE (SURROGATE) RECOVERY: 100 %

BTEX/GRO Sample pH < 2

BTEX SURROGATE RECOVERY: 104 %

GRO SURROGATE RECOVERY: 106 %

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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www.mvtl.com

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54131
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 15:15
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MW-5
W5631

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Chloroethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Chloromethane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
Bromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Dichlorodifluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Vinyl Chloride	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Methylene Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Trichlorofluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloroethane	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
trans-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Chloroform	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1,1-Trichloroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Carbon Tetrachloride	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Bromodichloromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichloropropane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
trans-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Trichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Chlorodibromomethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1,2-Trichloroethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
cis-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Bromoform	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,1,2,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Tetrachloroethene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Chlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Benzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Toluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Ethyl Benzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,3-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,4-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
cis-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,3-Dichloropropane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2,3-Trichloropropane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Allyl Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dibromoethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Methyl Ethyl Ketone	< 5	ug/L	5	SW8021 MDH 465F	13 Dec 06	DWR
Methyl Isobutyl Ketone	< 1.4	ug/L	1.4	SW8021 MDH 465F	13 Dec 06	DWR
Tetrahydrofuran	< 5	ug/L	5	SW8021 MDH 465F	13 Dec 06	DWR
m-Xylene and p-Xylene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
o-Xylene	< 0.3	ug/L	0.3	SW8021 MDH 465F	13 Dec 06	DWR

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54131
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 15:15
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MW-5
W5631

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cumene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,1,1,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Dichlorofluoromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Trichlorotrifluoroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Ethyl Ether	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Acetone	< 10	ug/L	10	SW8021 MDH 465F	13 Dec 06	DWR
Dibromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
2,2-Dichloropropane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
Bromochloromethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Methyl tert-butyl Ether	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Styrene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
n-Propylbenzene	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Bromobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
2-Chlorotoluene	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
1,3,5-Trimethylbenzene	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
4-Chlorotoluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
t-Butylbenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2,4-Trimethylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
sec-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
p-Isopropyltoluene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
n-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dibromo-3-chloropropane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,2,4-Trichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Hexachlorobutadiene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Naphthalene	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,2,3-Trichlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
GRO (TPH)	< 0.2	mg/L	0.2	8015B/OA1	8 Dec 06	RDC

GC VOC Sample pH < 2

1-CHLORO-4-FLUOROBENZENE (SURROGATE) RECOVERY: 101 %

BTEX/GRO Sample pH < 2

BTEX SURROGATE RECOVERY: 104 %

GRO SURROGATE RECOVERY: 97 %

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
: = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54132
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 13:55
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MW-6
W5632

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Chloroethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Chloromethane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
Bromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Dichlorodifluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Vinyl Chloride	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Methylene Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Trichlorofluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloroethane	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
trans-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Chloroform	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichloroethane	1.6	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1,1-Trichloroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Carbon Tetrachloride	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Bromodichloromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichloropropane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
trans-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Trichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Chlorodibromomethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1,2-Trichloroethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
cis-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Bromoform	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,1,2,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Tetrachloroethene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Chlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Benzene	39.9	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Toluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Ethyl Benzene	7.1	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,3-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,4-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
cis-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,3-Dichloropropane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2,3-Trichloropropane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Allyl Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dibromoethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Methyl Ethyl Ketone	< 5	ug/L	5	SW8021 MDH 465F	13 Dec 06	DWR
Methyl Isobutyl Ketone	3.1	ug/L	1.4	SW8021 MDH 465F	13 Dec 06	DWR
Tetrahydrofuran	< 5	ug/L	5	SW8021 MDH 465F	13 Dec 06	DWR
m-Xylene and p-Xylene	4.4	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
o-Xylene	< 0.3	ug/L	0.3	SW8021 MDH 465F	13 Dec 06	DWR

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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35 W. Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
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MEMBER ACIL

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54132
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 13:55
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MW-6
W5632

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cumene	1.3	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,1,1,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Dichlorofluoromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Trichlorotrifluoroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Ethyl Ether	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Acetone	< 10	ug/L	10	SW8021 MDH 465F	13 Dec 06	DWR
Dibromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
2,2-Dichloropropane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
Bromochloromethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Methyl tert-butyl Ether	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Styrene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
n-Propylbenzene	2.0	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Bromobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
2-Chlorotoluene	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
1,3,5-Trimethylbenzene	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
4-Chlorotoluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
t-Butylbenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2,4-Trimethylbenzene	0.8	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
sec-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
p-Isopropyltoluene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
n-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dibromo-3-chloropropane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,2,4-Trichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Hexachlorobutadiene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Naphthalene	2.8	ug/L	1.0	SW8021 MDH 465F	13 Dec 06	DWR
1,2,3-Trichlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
GRO (TPH)	< 0.2	mg/L	0.2	8015B/OA1	8 Dec 06	RDC

GC VOC Sample pH < 2

1-CHLORO-4-FLUOROBENZENE (SURROGATE) RECOVERY: 100 %

BTEX/GRO Sample pH < 2

BTEX SURROGATE RECOVERY: 109 %

GRO SURROGATE RECOVERY: 109 %

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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35 W. Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com

Report Date: 15 Dec 06
Lab Number: 06-A54133
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 13:30
Date Received: 8 Dec 06
PO #: CSI WATFORD

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Sample Description: MW-8
W5633

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Chloroethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Chloromethane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
Bromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Dichlorodifluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Vinyl Chloride	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Methylene Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Trichlorofluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloroethane	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
trans-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Chloroform	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1,1-Trichloroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Carbon Tetrachloride	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Bromodichloromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichloropropane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
trans-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Trichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Chlorodibromomethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1,2-Trichloroethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
cis-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Bromoform	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,1,2,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Tetrachloroethene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Chlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Benzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Toluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Ethyl Benzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,3-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,4-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
cis-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,3-Dichloropropane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2,3-Trichloropropane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Allyl Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dibromoethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Methyl Ethyl Ketone	< 5	ug/L	5	SW8021 MDH 465F	13 Dec 06	DWR
Methyl Isobutyl Ketone	< 1.4	ug/L	1.4	SW8021 MDH 465F	13 Dec 06	DWR
Tetrahydrofuran	< 5	ug/L	5	SW8021 MDH 465F	13 Dec 06	DWR
m-Xylene and p-Xylene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
o-Xylene	< 0.3	ug/L	0.3	SW8021 MDH 465F	13 Dec 06	DWR

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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www.mvtl.com

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54133
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 13:30
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MW-8
W5633

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cumene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,1,1,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Dichlorofluoromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Trichlorotrifluoroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Ethyl Ether	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Acetone	< 10	ug/L	10	SW8021 MDH 465F	13 Dec 06	DWR
Dibromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
2,2-Dichloropropane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
Bromochloromethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Methyl tert-butyl Ether	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Styrene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
n-Propylbenzene	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Bromobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
2-Chlorotoluene	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
1,3,5-Trimethylbenzene	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
4-Chlorotoluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
t-Butylbenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2,4-Trimethylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
sec-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
p-Isopropyltoluene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
n-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dibromo-3-chloropropane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,2,4-Trichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Hexachlorobutadiene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Naphthalene	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,2,3-Trichlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
GRO (TPH)	< 0.2	mg/L	0.2	8015B/OA1	8 Dec 06	RDC

GC VOC Sample pH < 2

1-CHLORO-4-FLUOROBENZENE (SURROGATE) RECOVERY: 100 %

BTEX/GRO Sample pH < 2

BTEX SURROGATE RECOVERY: 104 %

GRO SURROGATE RECOVERY: 95 %

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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35 W. Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com

MEMBER ACIL

Report Date: 15 Dec 06
Lab Number: 06-A54134
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 14:30
Date Received: 8 Dec 06
PO #: CSI WATFORD

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Sample Description: MW-9
W5634

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Chloroethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Chloromethane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
Bromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Dichlorodifluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Vinyl Chloride	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Methylene Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Trichlorofluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloroethane	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
trans-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Chloroform	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1,1-Trichloroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Carbon Tetrachloride	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Bromodichloromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichloropropane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
trans-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Trichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Chlorodibromomethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1,2-Trichloroethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
cis-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Bromoform	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,1,2,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Tetrachloroethene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Chlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Benzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Toluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Ethyl Benzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,3-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,4-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
cis-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,3-Dichloropropane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2,3-Trichloropropane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Allyl Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dibromoethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Methyl Ethyl Ketone	< 5	ug/L	5	SW8021 MDH 465F	13 Dec 06	DWR
Methyl Isobutyl Ketone	< 1.4	ug/L	1.4	SW8021 MDH 465F	13 Dec 06	DWR
Tetrahydrofuran	< 5	ug/L	5	SW8021 MDH 465F	13 Dec 06	DWR
m-Xylene and p-Xylene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
o-Xylene	< 0.3	ug/L	0.3	SW8021 MDH 465F	13 Dec 06	DWR

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54134
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 14:30
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MW-9
W5634

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cumene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,1,1,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Dichlorofluoromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Trichlorotrifluoroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Ethyl Ether	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Acetone	< 10	ug/L	10	SW8021 MDH 465F	13 Dec 06	DWR
Dibromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
2,2-Dichloropropane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
Bromochloromethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Methyl tert-butyl Ether	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Styrene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
n-Propylbenzene	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Bromobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
2-Chlorotoluene	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
1,3,5-Trimethylbenzene	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
4-Chlorotoluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
t-Butylbenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2,4-Trimethylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
sec-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
p-Isopropyltoluene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
n-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dibromo-3-chloropropane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,2,4-Trichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Hexachlorobutadiene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Naphthalene	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,2,3-Trichlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
GRO (TPH)	< 0.2	mg/L	0.2	8015B/OA1	8 Dec 06	RDC

GC VOC Sample pH < 2

1-CHLORO-4-FLUOROBENZENE (SURROGATE) RECOVERY: 100 %

BTEX/GRO Sample pH < 2

BTEX SURROGATE RECOVERY: 102 %

GRO SURROGATE RECOVERY: 96 %

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54137
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 10:15
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MW-11
W5637

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Chloroethane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Chloromethane	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
Bromomethane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Dichlorodifluoromethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Vinyl Chloride	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Methylene Chloride	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Trichlorofluoromethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloroethane	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
trans-1,2-Dichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Chloroform	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichloroethane	2466	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1,1-Trichloroethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Carbon Tetrachloride	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Bromodichloromethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichloropropane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
trans-1,3-Dichloropropene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Trichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Chlorodibromomethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1,2-Trichloroethane	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
cis-1,3-Dichloropropene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Bromoform	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,1,2,2-Tetrachloroethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Tetrachloroethene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Chlorobenzene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Benzene	18790	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Toluene	1008	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Ethyl Benzene	2125	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,3-Dichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,4-Dichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
cis-1,2-Dichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,3-Dichloropropane	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2,3-Trichloropropane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Allyl Chloride	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dibromoethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Methyl Ethyl Ketone	< 5000 #	ug/L	5	SW8021 MDH 465F	14 Dec 06	DWR
Methyl Isobutyl Ketone	< 1400 #	ug/L	1.4	SW8021 MDH 465F	14 Dec 06	DWR
Tetrahydrofuran	< 5000 #	ug/L	5	SW8021 MDH 465F	14 Dec 06	DWR
m-Xylene and p-Xylene	2534	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
o-Xylene	< 300 #	ug/L	0.3	SW8021 MDH 465F	14 Dec 06	DWR

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54137
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 10:15
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MW-11
W5637

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cumene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,1,1,2-Tetrachloroethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloropropene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Dichlorofluoromethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Trichlorotrifluoroethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Ethyl Ether	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Acetone	< 10000 #	ug/L	10	SW8021 MDH 465F	14 Dec 06	DWR
Dibromomethane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
2,2-Dichloropropane	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
Bromochloromethane	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Methyl tert-butyl Ether	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Styrene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
n-Propylbenzene	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Bromobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
2-Chlorotoluene	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
1,3,5-Trimethylbenzene	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
4-Chlorotoluene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
t-Butylbenzene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2,4-Trimethylbenzene	1232	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
sec-Butylbenzene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
p-Isopropyltoluene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
n-Butylbenzene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dibromo-3-chloropropane	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,2,4-Trichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Hexachlorobutadiene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Naphthalene	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,2,3-Trichlorobenzene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
GRO (TPH)	53.65	mg/L	0.200	8015B/OA1	11 Dec 06	RDC

GC VOC Sample pH > 2

1-CHLORO-4-FLUOROBENZENE (SURROGATE) RECOVERY: 99 %

BTEX/GRO Sample pH > 2

BTEX SURROGATE RECOVERY: 98 %

GRO SURROGATE RECOVERY: 107 %

GRO(TPH) pattern is characteristic of gasoline.

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
: = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54138
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 9:30
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MW-13
W5638

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Chloroethane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Chloromethane	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
Bromomethane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Dichlorodifluoromethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Vinyl Chloride	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Methylene Chloride	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Trichlorofluoromethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloroethane	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
trans-1,2-Dichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Chloroform	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichloroethane	1828	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1,1-Trichloroethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Carbon Tetrachloride	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Bromodichloromethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichloropropane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
trans-1,3-Dichloropropene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Trichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Chlorodibromomethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1,2-Trichloroethane	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
cis-1,3-Dichloropropene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Bromoform	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,1,2,2-Tetrachloroethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Tetrachloroethene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Chlorobenzene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Benzene	29370	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Toluene	4430	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Ethyl Benzene	3814	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,3-Dichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,4-Dichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
cis-1,2-Dichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,3-Dichloropropane	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2,3-Trichloropropane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Allyl Chloride	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dibromoethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Methyl Ethyl Ketone	< 5000 #	ug/L	5	SW8021 MDH 465F	14 Dec 06	DWR
Methyl Isobutyl Ketone	< 1400 #	ug/L	1.4	SW8021 MDH 465F	14 Dec 06	DWR
Tetrahydrofuran	< 5000 #	ug/L	5	SW8021 MDH 465F	14 Dec 06	DWR
m-Xylene and p-Xylene	9538	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
o-Xylene	1088	ug/L	0.3	SW8021 MDH 465F	14 Dec 06	DWR

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54138
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 9:30
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MW-13
W5638

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cumene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,1,1,2-Tetrachloroethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloropropene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Dichlorofluoromethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Trichlorotrifluoroethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Ethyl Ether	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Acetone	< 10000 #	ug/L	10	SW8021 MDH 465F	14 Dec 06	DWR
Dibromomethane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
2,2-Dichloropropane	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
Bromochloromethane	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Methyl tert-butyl Ether	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Styrene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
n-Propylbenzene	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Bromobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
2-Chlorotoluene	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
1,3,5-Trimethylbenzene	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
4-Chlorotoluene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
t-Butylbenzene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2,4-Trimethylbenzene	1674	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
sec-Butylbenzene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
p-Isopropyltoluene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
n-Butylbenzene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dibromo-3-chloropropane	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,2,4-Trichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Hexachlorobutadiene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Naphthalene	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,2,3-Trichlorobenzene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
GRO (TPH)	112.7	mg/L	0.200	8015B/OA1	11 Dec 06	RDC

GC VOC Sample pH < 2

1-CHLORO-4-FLUOROBENZENE (SURROGATE) RECOVERY: 101 %

BTEX/GRO Sample pH < 2

BTEX SURROGATE RECOVERY: 93 %

GRO SURROGATE RECOVERY: 114 %

GRO(TPH) pattern is characteristic of gasoline.

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54140
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 10:30
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MW-14 = MW 11 Duplicate
W5640

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Chloroethane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Chloromethane	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
Bromomethane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Dichlorodifluoromethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Vinyl Chloride	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Methylene Chloride	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Trichlorofluoromethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloroethane	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
trans-1,2-Dichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Chloroform	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichloroethane	2869	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1,1-Trichloroethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Carbon Tetrachloride	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Bromodichloromethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichloropropane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
trans-1,3-Dichloropropene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Trichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Chlorodibromomethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1,2-Trichloroethane	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
cis-1,3-Dichloropropene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Bromoform	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,1,2,2-Tetrachloroethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Tetrachloroethene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Chlorobenzene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Benzene	21550	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Toluene	1125	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Ethyl Benzene	2406	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,3-Dichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,4-Dichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
cis-1,2-Dichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,3-Dichloropropane	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2,3-Trichloropropane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Allyl Chloride	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dibromoethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Methyl Ethyl Ketone	< 5000 #	ug/L	5	SW8021 MDH 465F	14 Dec 06	DWR
Methyl Isobutyl Ketone	< 1400 #	ug/L	1.4	SW8021 MDH 465F	14 Dec 06	DWR
Tetrahydrofuran	< 5000 #	ug/L	5	SW8021 MDH 465F	14 Dec 06	DWR
m-Xylene and p-Xylene	2840	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
o-Xylene	< 300 #	ug/L	0.3	SW8021 MDH 465F	14 Dec 06	DWR

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54140
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 10:30
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MW-14
W5640

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cumene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,1,1,2-Tetrachloroethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloropropene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Dichlorofluoromethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Trichlorotrifluoroethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Ethyl Ether	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Acetone	< 10000 #	ug/L	10	SW8021 MDH 465F	14 Dec 06	DWR
Dibromomethane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
2,2-Dichloropropane	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
Bromochloromethane	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Methyl tert-butyl Ether	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Styrene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
n-Propylbenzene	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Bromobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
2-Chlorotoluene	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
1,3,5-Trimethylbenzene	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
4-Chlorotoluene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
t-Butylbenzene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2,4-Trimethylbenzene	1316	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
sec-Butylbenzene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
p-Isopropyltoluene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
n-Butylbenzene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dibromo-3-chloropropane	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,2,4-Trichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Hexachlorobutadiene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Naphthalene	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,2,3-Trichlorobenzene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
GRO (TPH)	82.22	mg/L	0.200	8015B/OA1	11 Dec 06	RDC

GC VOC Sample pH > 2

1-CHLORO-4-FLUOROBENZENE (SURROGATE) RECOVERY: 99 %

BTEX/GRO Sample pH > 2

BTEX SURROGATE RECOVERY: 99 %

GRO SURROGATE RECOVERY: 110 %

GRO(TPH) pattern is characteristic of gasoline.

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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www.mvtl.com

Report Date: 15 Dec 06
Lab Number: 06-A54139
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 12:00
Date Received: 8 Dec 06
PO #: CSI WATFORD

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Sample Description: REC-1
W5639

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Chloroethane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Chloromethane	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
Bromomethane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Dichlorodifluoromethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Vinyl Chloride	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Methylene Chloride	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Trichlorofluoromethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloroethane	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
trans-1,2-Dichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Chloroform	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichloroethane	2095	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1,1-Trichloroethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Carbon Tetrachloride	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Bromodichloromethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichloropropane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
trans-1,3-Dichloropropene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Trichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Chlorodibromomethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1,2-Trichloroethane	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
cis-1,3-Dichloropropene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Bromoform	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,1,2,2-Tetrachloroethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Tetrachloroethene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Chlorobenzene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Benzene	17800	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Toluene	862.9	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Ethyl Benzene	3206	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,3-Dichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,4-Dichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
cis-1,2-Dichloroethene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,3-Dichloropropane	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2,3-Trichloropropane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Allyl Chloride	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dibromoethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Methyl Ethyl Ketone	< 5000 #	ug/L	5	SW8021 MDH 465F	14 Dec 06	DWR
Methyl Isobutyl Ketone	< 1400 #	ug/L	1.4	SW8021 MDH 465F	14 Dec 06	DWR
Tetrahydrofuran	< 5000 #	ug/L	5	SW8021 MDH 465F	14 Dec 06	DWR
m-Xylene and p-Xylene	4054	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
o-Xylene	322.4	ug/L	0.3	SW8021 MDH 465F	14 Dec 06	DWR

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54139
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 12:00
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: REC-1
W5639

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cumene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,1,1,2-Tetrachloroethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloropropene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Dichlorofluoromethane	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Trichlorotrifluoroethane	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Ethyl Ether	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Acetone	< 10000 #	ug/L	10	SW8021 MDH 465F	14 Dec 06	DWR
Dibromomethane	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
2,2-Dichloropropane	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
Bromochloromethane	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Methyl tert-butyl Ether	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Styrene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
n-Propylbenzene	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Bromobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
2-Chlorotoluene	< 800 #	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
1,3,5-Trimethylbenzene	< 900 #	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
4-Chlorotoluene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
t-Butylbenzene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2,4-Trimethylbenzene	1899	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
sec-Butylbenzene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
p-Isopropyltoluene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
n-Butylbenzene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dibromo-3-chloropropane	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,2,4-Trichlorobenzene	< 500 #	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Hexachlorobutadiene	< 700 #	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Naphthalene	< 1000 #	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,2,3-Trichlorobenzene	< 600 #	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
GRO (TPH)	65.63	mg/L	0.200	8015B/OA1	11 Dec 06	RDC

GC VOC Sample pH > 2

1-CHLORO-4-FLUOROBENZENE (SURROGATE) RECOVERY: 101 %

BTEX/GRO Sample pH > 2

BTEX SURROGATE RECOVERY: 99 %

GRO SURROGATE RECOVERY: 111 %

GRO(TPH) pattern is characteristic of gasoline.

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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www.mvtl.com

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54135
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 11:45
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: CHERRY CREEK
W5635

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Chloroethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Chloromethane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
Bromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Dichlorodifluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Vinyl Chloride	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Methylene Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Trichlorofluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloroethane	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
trans-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Chloroform	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1,1-Trichloroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Carbon Tetrachloride	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Bromodichloromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichloropropane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
trans-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Trichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Chlorodibromomethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1,2-Trichloroethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
cis-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Bromoform	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,1,2,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Tetrachloroethene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Chlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Benzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Toluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Ethyl Benzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,3-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,4-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
cis-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,3-Dichloropropane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2,3-Trichloropropane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Allyl Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dibromoethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Methyl Ethyl Ketone	< 5	ug/L	5	SW8021 MDH 465F	13 Dec 06	DWR
Methyl Isobutyl Ketone	< 1.4	ug/L	1.4	SW8021 MDH 465F	13 Dec 06	DWR
Tetrahydrofuran	< 5	ug/L	5	SW8021 MDH 465F	13 Dec 06	DWR
m-Xylene and p-Xylene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
o-Xylene	< 0.3	ug/L	0.3	SW8021 MDH 465F	13 Dec 06	DWR

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54135
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 11:45
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: CHERRY CREEK
W5635

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cumene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,1,1,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Dichlorofluoromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Trichlorotrifluoroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Ethyl Ether	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Acetone	13.6	ug/L	10.0	SW8021 MDH 465F	13 Dec 06	DWR
Dibromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
2,2-Dichloropropane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
Bromochloromethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Methyl tert-butyl Ether	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Styrene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
n-Propylbenzene	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Bromobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
2-Chlorotoluene	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
1,3,5-Trimethylbenzene	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
4-Chlorotoluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
t-Butylbenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2,4-Trimethylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
sec-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
p-Isopropyltoluene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
n-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dibromo-3-chloropropane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,2,4-Trichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Hexachlorobutadiene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Naphthalene	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,2,3-Trichlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
GRO (TPH)	< 0.2	mg/L	0.2	8015B/OA1	11 Dec 06	RDC

GC VOC Sample pH < 2

1-CHLORO-4-FLUOROBENZENE (SURROGATE) RECOVERY: 103 %

BTEX/GRO Sample pH < 2

BTEX SURROGATE RECOVERY: 84 %

GRO SURROGATE RECOVERY: 95 %

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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www.mvtl.com

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54136
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 15:35
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MUNICIPAL WELL
W5636

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Chloroethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Chloromethane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
Bromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Dichlorodifluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Vinyl Chloride	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Methylene Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Trichlorofluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloroethane	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
trans-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Chloroform	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1,1-Trichloroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Carbon Tetrachloride	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Bromodichloromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichloropropane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
trans-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Trichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Chlorodibromomethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1,2-Trichloroethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
cis-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Bromoform	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,1,2,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Tetrachloroethene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Chlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Benzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Toluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Ethyl Benzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,3-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,4-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
cis-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,3-Dichloropropane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2,3-Trichloropropane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Allyl Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dibromoethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Methyl Ethyl Ketone	< 5	ug/L	5	SW8021 MDH 465F	13 Dec 06	DWR
Methyl Isobutyl Ketone	< 1.4	ug/L	1.4	SW8021 MDH 465F	13 Dec 06	DWR
Tetrahydrofuran	< 5	ug/L	5	SW8021 MDH 465F	13 Dec 06	DWR
m-Xylene and p-Xylene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
o-Xylene	< 0.3	ug/L	0.3	SW8021 MDH 465F	13 Dec 06	DWR

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54136
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06 15:35
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: MUNICIPAL WELL
W5636

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cumene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,1,1,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
1,1-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Dichlorofluoromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Trichlorotrifluoroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
Ethyl Ether	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Acetone	< 10	ug/L	10	SW8021 MDH 465F	13 Dec 06	DWR
Dibromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
2,2-Dichloropropane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
Bromochloromethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Methyl tert-butyl Ether	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
Styrene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
n-Propylbenzene	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
Bromobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
2-Chlorotoluene	< 0.8	ug/L	0.8	SW8021 MDH 465F	13 Dec 06	DWR
1,3,5-Trimethylbenzene	< 0.9	ug/L	0.9	SW8021 MDH 465F	13 Dec 06	DWR
4-Chlorotoluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
t-Butylbenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
1,2,4-Trimethylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
sec-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
p-Isopropyltoluene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
n-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
1,2-Dibromo-3-chloropropane	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,2,4-Trichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	13 Dec 06	DWR
Hexachlorobutadiene	< 0.7	ug/L	0.7	SW8021 MDH 465F	13 Dec 06	DWR
Naphthalene	< 1	ug/L	1	SW8021 MDH 465F	13 Dec 06	DWR
1,2,3-Trichlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	13 Dec 06	DWR
GRO (TPH)	< 0.2	mg/L	0.2	8015B/OA1	8 Dec 06	RDC

GC VOC Sample pH < 2

1-CHLORO-4-FLUOROBENZENE (SURROGATE) RECOVERY: 99 %

BTEX/GRO Sample pH < 2

BTEX SURROGATE RECOVERY: 104 %

GRO SURROGATE RECOVERY: 96 %

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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www.mvtl.com

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54141
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: FIELD BLANK
W5641

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Chloroethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Chloromethane	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
Bromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Dichlorodifluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Vinyl Chloride	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Methylene Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Trichlorofluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloroethane	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
trans-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Chloroform	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1,1-Trichloroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Carbon Tetrachloride	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Bromodichloromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichloropropane	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
trans-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Trichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Chlorodibromomethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1,2-Trichloroethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
cis-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Bromoform	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,1,2,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Tetrachloroethene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Chlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Benzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Toluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Ethyl Benzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,3-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,4-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
cis-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,3-Dichloropropane	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2,3-Trichloropropane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Allyl Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dibromoethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Methyl Ethyl Ketone	< 5	ug/L	5	SW8021 MDH 465F	14 Dec 06	DWR
Methyl Isobutyl Ketone	< 1.4	ug/L	1.4	SW8021 MDH 465F	14 Dec 06	DWR
Tetrahydrofuran	< 5	ug/L	5	SW8021 MDH 465F	14 Dec 06	DWR
m-Xylene and p-Xylene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
o-Xylene	< 0.3	ug/L	0.3	SW8021 MDH 465F	14 Dec 06	DWR

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54141
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: FIELD BLANK
W5641

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cumene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,1,1,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Dichlorofluoromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Trichlorotrifluoroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Ethyl Ether	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Acetone	< 10	ug/L	10	SW8021 MDH 465F	14 Dec 06	DWR
Dibromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
2,2-Dichloropropane	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
Bromochloromethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Methyl tert-butyl Ether	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Styrene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
n-Propylbenzene	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Bromobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
2-Chlorotoluene	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
1,3,5-Trimethylbenzene	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
4-Chlorotoluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
t-Butylbenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2,4-Trimethylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
sec-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
p-Isopropyltoluene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
n-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dibromo-3-chloropropane	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,2,4-Trichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Hexachlorobutadiene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Naphthalene	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,2,3-Trichlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
GRO (TPH)	< 0.2	mg/L	0.2	8015B/OA1	8 Dec 06	RDC

** No collection time supplied by the client.

GC VOC Sample pH < 2

1-CHLORO-4-FLUOROBENZENE (SURROGATE) RECOVERY: 99 %

BTEX/GRO Sample pH < 2

BTEX SURROGATE RECOVERY: 105 %

GRO SURROGATE RECOVERY: 94 %

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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www.mvtl.com

Report Date: 15 Dec 06
Lab Number: 06-A54142
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06
Date Received: 8 Dec 06
PO #: CSI WATFORD

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Sample Description: EQUIPMENT BLANK
W5642

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Chloroethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Chloromethane	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
Bromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Dichlorodifluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Vinyl Chloride	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Methylene Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Trichlorofluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloroethane	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
trans-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Chloroform	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1,1-Trichloroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Carbon Tetrachloride	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Bromodichloromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichloropropane	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
trans-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Trichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Chlorodibromomethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1,2-Trichloroethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
cis-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Bromoform	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,1,2,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Tetrachloroethene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Chlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Benzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Toluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Ethyl Benzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,3-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,4-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
cis-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,3-Dichloropropane	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2,3-Trichloropropane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Allyl Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dibromoethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Methyl Ethyl Ketone	< 5	ug/L	5	SW8021 MDH 465F	14 Dec 06	DWR
Methyl Isobutyl Ketone	< 1.4	ug/L	1.4	SW8021 MDH 465F	14 Dec 06	DWR
Tetrahydrofuran	< 5	ug/L	5	SW8021 MDH 465F	14 Dec 06	DWR
m-Xylene and p-Xylene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
o-Xylene	< 0.3	ug/L	0.3	SW8021 MDH 465F	14 Dec 06	DWR

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
1411 S. 12th St. ~ Bismarck, ND 58502 ~ 800-279-6885 ~ Fax 701-258-9724
35 W. Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com
MEMBER ACIL

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54142
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: EQUIPMENT BLANK
W5642

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cumene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,1,1,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Dichlorofluoromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Trichlorotrifluoroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Ethyl Ether	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Acetone	< 10	ug/L	10	SW8021 MDH 465F	14 Dec 06	DWR
Dibromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
2,2-Dichloropropane	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
Bromochloromethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Methyl tert-butyl Ether	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Styrene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
n-Propylbenzene	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Bromobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
2-Chlorotoluene	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
1,3,5-Trimethylbenzene	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
4-Chlorotoluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
t-Butylbenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2,4-Trimethylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
sec-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
p-Isopropyltoluene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
n-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dibromo-3-chloropropane	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,2,4-Trichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Hexachlorobutadiene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Naphthalene	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,2,3-Trichlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
GRO (TPH)	< 0.2	mg/L	0.2	8015B/OA1	8 Dec 06	RDC

** No collection time supplied by the client.

GC VOC Sample pH < 2

1-CHLORO-4-FLUOROBENZENE (SURROGATE) RECOVERY: 100 %

BTEX/GRO Sample pH < 2

BTEX SURROGATE RECOVERY: 104 %

GRO SURROGATE RECOVERY: 98 %

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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35 W. Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com

Report Date: 15 Dec 06
Lab Number: 06-A54143
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06
Date Received: 8 Dec 06
PO #: CSI WATFORD

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Sample Description: TRIP BLANK

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Chloroethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Chloromethane	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
Bromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Dichlorodifluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Vinyl Chloride	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Methylene Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Trichlorofluoromethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloroethane	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
trans-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Chloroform	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1,1-Trichloroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Carbon Tetrachloride	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Bromodichloromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichloropropane	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
trans-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Trichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Chlorodibromomethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1,2-Trichloroethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
cis-1,3-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Bromoform	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,1,2,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Tetrachloroethene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Chlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Benzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Toluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Ethyl Benzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,3-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,4-Dichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
cis-1,2-Dichloroethene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,3-Dichloropropane	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2,3-Trichloropropane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Allyl Chloride	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dibromoethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Methyl Ethyl Ketone	< 5	ug/L	5	SW8021 MDH 465F	14 Dec 06	DWR
Methyl Isobutyl Ketone	< 1.4	ug/L	1.4	SW8021 MDH 465F	14 Dec 06	DWR
Tetrahydrofuran	< 5	ug/L	5	SW8021 MDH 465F	14 Dec 06	DWR
m-Xylene and p-Xylene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
o-Xylene	< 0.3	ug/L	0.3	SW8021 MDH 465F	14 Dec 06	DWR

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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www.mvtl.com

JARDA SOLC
ENERGY & ENVIRONMENTAL RESEARCH CTR
UNIVERSITY OF NORTH DAKOTA
GRAND FORKS ND 58203

Report Date: 15 Dec 06
Lab Number: 06-A54143
Work Order #:82-2656
Account #: 007033
Sample Matrix: GROUNDWATER
Date Sampled: 6 Dec 06
Date Received: 8 Dec 06
PO #: CSI WATFORD

Sample Description: TRIP BLANK

Temp at Receipt: 6.0 C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cumene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,1,1,2-Tetrachloroethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
1,1-Dichloropropene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Dichlorofluoromethane	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Trichlorotrifluoroethane	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
Ethyl Ether	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Acetone	< 10	ug/L	10	SW8021 MDH 465F	14 Dec 06	DWR
Dibromomethane	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
2,2-Dichloropropane	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
Bromochloromethane	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Methyl tert-butyl Ether	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
Styrene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
n-Propylbenzene	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
Bromobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
2-Chlorotoluene	< 0.8	ug/L	0.8	SW8021 MDH 465F	14 Dec 06	DWR
1,3,5-Trimethylbenzene	< 0.9	ug/L	0.9	SW8021 MDH 465F	14 Dec 06	DWR
4-Chlorotoluene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
t-Butylbenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
1,2,4-Trimethylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
sec-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
p-Isopropyltoluene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
n-Butylbenzene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
1,2-Dibromo-3-chloropropane	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,2,4-Trichlorobenzene	< 0.5	ug/L	0.5	SW8021 MDH 465F	14 Dec 06	DWR
Hexachlorobutadiene	< 0.7	ug/L	0.7	SW8021 MDH 465F	14 Dec 06	DWR
Naphthalene	< 1	ug/L	1	SW8021 MDH 465F	14 Dec 06	DWR
1,2,3-Trichlorobenzene	< 0.6	ug/L	0.6	SW8021 MDH 465F	14 Dec 06	DWR
GRO (TPH)	< 0.2	mg/L	0.2	8015B/OA1	8 Dec 06	RDC

** No collection time supplied by the client.

GC VOC Sample pH < 2

1-CHLORO-4-FLUOROBENZENE (SURROGATE) RECOVERY: 100 %

BTEX/GRO Sample pH < 2

BTEX SURROGATE RECOVERY: 104 %

GRO SURROGATE RECOVERY: 95 %

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

CHAIN OF CUSTODY RECORD

MVTL LABORATORIES, Inc.
1411 South 12th Street
Bismarck, ND 58504
Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

PLEASE DO NOT WRITE IN THE SHADED AREAS

Nº 3152

WORK ORDER # 52-2656

Company Name and Address: UND / EERC 15 N 23rd St Grand Forks ND 58202	Account #:	Phone #: 701-777-5000
	Contact: JARDA Solc	Fax #: 701-777-5181
	Name of Sampler: Randy Knutson	For faxed report check box ☑
Billing Address (indicate name and address if different from above):	Quote #:	Date Submitted: 12/7/06
	Project Name/Number: USI - WATFORD	Purchase Order #:

Lab Use Only	Your Sample I.D. or Number	Sample Description	Date / Time	Type of Sample (Matrix or Substance) Soil	Water	Food	Other (Please Be Specific)	Analyze For:
	Example	Tank Bottom Tank #3	01/01/99 11:45 a.m.			X	Sampled Liquid Layer Not bottom sludge	Vitamin A, TKN, Iron, Calcium BOD, COD, Acetone, Shelf Life
WS630	MW-1		12/6/06 9:45		X			465F+GRO, Sulfate, BOD, TP, NO_3 COD, TOC, NH_3, Fe/MnT, Fe/Mn d
WS631	MW-5		12/6/06 15:15		X			
WS632	MW-6		12/6/06 13:55		X			
WS633	MW-8		12/6/06 13:30		X			
WS634	MW-9		12/6/06 14:30		X			
WS635	~~MW~~ - CherryCreek		12/6/06 11:45		X			
WS636	Municipal Well		12/6/06 15:35		X			
WS637	MW-11		12/6/06 10:15		X			465F+GRO, Sulfate, BOD, TP, NO_3, COD TOC, NH_3, Fe/MnT, Fe/Mn d, BTEX-GR
WS638	MW-13		12/6/06 9:30		X			
WS640	MW-14		12/6/06 10:30		X			BTEX 16RO

	Transferred by:	Comments: (Sample Condition)	Date / Time	Received by:	Comments: (Sample Condition)	Date / Time	°C
1	Randy Knutson	Cooler	12/7/06	Tina Olson		7 Dec 06 8:15	
2							
3							

Disposed of By:

Disposal Comments:

Please submit the top two copies with your samples. We will return the completed original with your results.

CHAIN OF CUSTODY RECORD

PLEASE DO NOT WRITE IN THE SHADED AREAS

MVTL LABORATORIES, Inc.
1411 South 12th Street
Bismarck, ND 58504
Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

WORK ORDER # SA-2656

Company Name and Address:	Account #:	Phone #:
UND / EERC 15 N 23rd St Grand Forks, ND 58202	Contact: Jarda Solc Name of Sampler:	701-777-5000 Fax: 701-777-5181 For faxed report check box ☑
Billing Address (indicate name and address if different from above):	Quote #:	Date Submitted: 12/7/06
	Project Name/Number:	Purchase Order #:

Lab Use Only	Your Sample I.D. or Number	Sample Description	Date / Time	Type of Sample (Matrix or Substance) Soil	Water	Food	Other (Please Be Specific)	Analyze For:
	Example	Tank Bottom Tank #3	01/01/99 11:45 a.m.			X	Sampled Liquid Layer Not bottom sludge	Vitamin A, TKN, Iron, Calcium BOD, COD, Acetone, Shelf Life
WS6639	REC-1		12/6/06 12:00 pm			X		465 FTGRO, Sulfate, BOD, TP, NO_3, COD TOC, NH_3, Fe/mnT, Fe/mnD, BTEX GRO
WS6641	Field Blank							
WS6642	Equip Blank							
	Trip Blank							1 1

	Transferred by:	Comments: (Sample Condition)	Date / Time	Received by:	Comments: (Sample Condition)	Date / Time	°C
1	Randy Knutson	Cooler		Tera K Olson		7 Dec 06 810	
2							
3							

Disposed of By: Disposal Comments:

Please submit the top two copies with your samples. We will return the completed original with your results.

APPENDIX G-2

BIODEGRADATION INDICATORS

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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1411 S. 12th St. ~ Bismarck, ND 58502 ~ 800-279-6885 ~ Fax 701-258-9724
35 W. Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com

Report Date: 22 Dec 06
Lab Number: 06-W5630
Work Order #: 82-2656
Account #: 007033
Date Sampled: 6 Dec 06 8:45
Date Received: 7 Dec 06 8:10
PO #: CSI Watford

Jarda Solc
UND-Energy & Environmental
15 N. 23rd St.
Grand Forks ND 58201

Sample Description: MW-1
Sample Site: Watford City

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Biochemical Oxygen Demand	< 2	mg/l	2	SM 5210-B	7 Dec 06 8:45	Shannon
Total Organic Carbon	27.0	mg/l	0.5	SM5310-C	11 Dec 06 8:30	Wayne
Sulfate	8500	mg/l	5.00	EPA 375.4	12 Dec 06 15:31	Morgan
Nitrate-Nitrite as N	0.18	mg/l	0.10	353.2	13 Dec 06 9:00	Morgan
Ammonia-Nitrogen as N	< 0.1	mg/l	0.10	EPA 350.1	15 Dec 06 10:00	Morgan
Phosphorus as P - Total	0.16	mg/l	0.10	EPA 365.1	11 Dec 06 12:00	Morgan
Chemical Oxygen Demand	63.6	mg/l	1.0	HACH 8000	8 Dec 06 8:30	Wayne
Iron - Total	37.4	mg/l	0.10	6010	21 Dec 06 9:12	Stacy
Manganese - Total	7.80	mg/l	0.05	6010	21 Dec 06 9:12	Stacy
Iron - Dissolved	< 0.1	mg/l	0.10	6010	14 Dec 06 9:41	Stacy
Manganese - Dissolved	< 0.05	mg/l	0.05	6010	14 Dec 06 9:41	Stacy

Approved by: C. Cantell

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267 ND # ND-00016

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Report Date: 22 Dec 06
Lab Number: 06-W5631
Work Order #: 82-2656
Account #: 007033
Date Sampled: 6 Dec 06 15:15
Date Received: 7 Dec 06 8:10
PO #: CSI Watford

Jarda Solc
UND-Energy & Environmental
15 N. 23rd St.
Grand Forks ND 58201

Sample Description: MW-5
Sample Site: Watford City

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Biochemical Oxygen Demand	2.62	mg/l	2	SM 5210-B	7 Dec 06 8:45	Shannon
Total Organic Carbon	8.4	mg/l	0.5	SM5310-C	11 Dec 06 8:30	Wayne
Sulfate	2390	mg/l	5.00	EPA 375.4	12 Dec 06 15:31	Morgan
Nitrate-Nitrite as N	< 0.1	mg/l	0.10	353.2	13 Dec 06 9:00	Morgan
Ammonia-Nitrogen as N	0.79	mg/l	0.10	EPA 350.1	15 Dec 06 10:00	Morgan
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	11 Dec 06 12:00	Morgan
Chemical Oxygen Demand	13.3	mg/l	1.0	HACH 8000	8 Dec 06 8:30	Wayne
Iron - Total	20.0	mg/l	0.10	6010	21 Dec 06 9:12	Stacy
Manganese - Total	0.71	mg/l	0.05	6010	21 Dec 06 9:12	Stacy
Iron - Dissolved	0.80	mg/l	0.10	6010	14 Dec 06 9:41	Stacy
Manganese - Dissolved	0.38	mg/l	0.05	6010	14 Dec 06 9:41	Stacy

Approved by: C Canfield

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267 ND # ND-00016

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Report Date: 22 Dec 06
Lab Number: 06-W5632
Work Order #: 82-2656
Account #: 007033
Date Sampled: 6 Dec 06 13:55
Date Received: 7 Dec 06 8:10
PO #: CSI Watford

Jarda Solc
UND-Energy & Environmental
15 N. 23rd St.
Grand Forks ND 58201

Sample Description: MW-6
Sample Site: Watford City

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Biochemical Oxygen Demand	2.74	mg/l	2	SM 5210-B	7 Dec 06 8:45	Shannon
Total Organic Carbon	6.4	mg/l	0.5	SM5310-C	11 Dec 06 8:30	Wayne
Sulfate	988	mg/l	5.00	EPA 375.4	12 Dec 06 15:31	Morgan
Nitrate-Nitrite as N	0.20	mg/l	0.10	353.2	13 Dec 06 9:00	Morgan
Ammonia-Nitrogen as N	0.89	mg/l	0.10	EPA 350.1	15 Dec 06 10:00	Morgan
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	11 Dec 06 12:00	Morgan
Chemical Oxygen Demand	42.5	mg/l	1.0	HACH 8000	8 Dec 06 8:30	Wayne
Iron - Total	28.1	mg/l	0.10	6010	21 Dec 06 9:12	Stacy
Manganese - Total	0.85	mg/l	0.05	6010	21 Dec 06 9:12	Stacy
Iron - Dissolved	6.48	mg/l	0.10	6010	14 Dec 06 9:41	Stacy
Manganese - Dissolved	0.73	mg/l	0.05	6010	14 Dec 06 9:41	Stacy

Approved by: C. Canrell

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
: = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267 ND # ND-00016

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Report Date: 22 Dec 06
Lab Number: 06-W5633
Work Order #: 82-2656
Account #: 007033
Date Sampled: 6 Dec 06 13:30
Date Received: 7 Dec 06 8:10
PO #: CSI Watford

Jarda Solc
UND-Energy & Environmental
15 N. 23rd St.
Grand Forks ND 58201

Sample Description: MW-8
Sample Site: Watford City

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Biochemical Oxygen Demand	< 2	mg/l	2	SM 5210-B	7 Dec 06 8:45	Shannon
Total Organic Carbon	27.0	mg/l	0.5	SM5310-C	11 Dec 06 8:30	Wayne
Sulfate	13200	mg/l	5.00	EPA 375.4	12 Dec 06 15:31	Morgan
Nitrate-Nitrite as N	< 0.1	mg/l	0.10	353.2	13 Dec 06 9:00	Morgan
Ammonia-Nitrogen as N	0.11	mg/l	0.10	EPA 350.1	15 Dec 06 10:00	Morgan
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	11 Dec 06 12:00	Morgan
Chemical Oxygen Demand	63.6	mg/l	1.0	HACH 8000	8 Dec 06 8:30	Wayne
Iron - Total	24.2	mg/l	0.10	6010	21 Dec 06 9:12	Stacy
Manganese - Total	2.29	mg/l	0.05	6010	21 Dec 06 9:12	Stacy
Iron - Dissolved	< 0.1	mg/l	0.10	6010	14 Dec 06 9:41	Stacy
Manganese - Dissolved	0.08	mg/l	0.05	6010	14 Dec 06 9:41	Stacy

Approved by: C. Cantell

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
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= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267 ND # ND-00016

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Report Date: 22 Dec 06
Lab Number: 06-W5634
Work Order #: 82-2656
Account #: 007033
Date Sampled: 6 Dec 06 14:30
Date Received: 7 Dec 06 8:10
PO #: CSI Watford

Jarda Solc
UND-Energy & Environmental
15 N. 23rd St.
Grand Forks ND 58201

Sample Description: MW-9
Sample Site: Watford City

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Biochemical Oxygen Demand	3.32	mg/l	2	SM 5210-B	7 Dec 06 8:45	Shannon
Total Organic Carbon	6.4	mg/l	0.5	SM5310-C	11 Dec 06 8:30	Wayne
Sulfate	1490	mg/l	5.00	EPA 375.4	12 Dec 06 15:31	Morgan
Nitrate-Nitrite as N	< 0.1	mg/l	0.10	353.2	13 Dec 06 9:00	Morgan
Ammonia-Nitrogen as N	1.64	mg/l	0.10	EPA 350.1	15 Dec 06 10:00	Morgan
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	11 Dec 06 12:00	Morgan
Chemical Oxygen Demand	29.5	mg/l	1.0	HACH 8000	8 Dec 06 8:30	Wayne
Iron - Total	26.9	mg/l	0.10	6010	21 Dec 06 9:12	Stacy
Manganese - Total	1.03	mg/l	0.05	6010	21 Dec 06 9:12	Stacy
Iron - Dissolved	8.42	mg/l	0.10	6010	14 Dec 06 9:41	Stacy
Manganese - Dissolved	0.95	mg/l	0.05	6010	14 Dec 06 9:41	Stacy

Approved by: C Carrel

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
: = Due to sample quantity
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+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267 ND # ND-00016

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Report Date: 22 Dec 06
Lab Number: 06-W5635
Work Order #: 82-2656
Account #: 007033
Date Sampled: 6 Dec 06 11:45
Date Received: 7 Dec 06 8:10
PO #: CSI Watford

Jarda Solc
UND-Energy & Environmental
15 N. 23rd St.
Grand Forks ND 58201

Sample Description: Cherry Creek
Sample Site: Watford City

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Biochemical Oxygen Demand	7.27	mg/l	2	SM 5210-B	7 Dec 06 8:45	Shannon
Total Organic Carbon	22.0	mg/l	0.5	SM5310-C	11 Dec 06 8:30	Wayne
Sulfate	1160	mg/l	5.00	EPA 375.4	12 Dec 06 15:31	Morgan
Nitrate-Nitrite as N	< 0.1	mg/l	0.10	353.2	13 Dec 06 9:00	Morgan
Ammonia-Nitrogen as N	< 0.1	mg/l	0.10	EPA 350.1	15 Dec 06 10:00	Morgan
Phosphorus as P - Total	0.22	mg/l	0.10	EPA 365.1	11 Dec 06 12:00	Morgan
Chemical Oxygen Demand	57.1	mg/l	1.0	HACH 8000	8 Dec 06 8:30	Wayne
Iron - Total	1.57	mg/l	0.10	6010	21 Dec 06 9:12	Stacy
Manganese - Total	0.18	mg/l	0.05	6010	21 Dec 06 9:12	Stacy
Iron - Dissolved	< 0.1	mg/l	0.10	6010	14 Dec 06 9:41	Stacy
Manganese - Dissolved	< 0.05	mg/l	0.05	6010	14 Dec 06 9:41	Stacy

Approved by: C. Canrep

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
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+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267 ND # ND-00016

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Report Date: 22 Dec 06
Lab Number: 06-W5636
Work Order #: 82-2656
Account #: 007033
Date Sampled: 6 Dec 06 15:35
Date Received: 7 Dec 06 8:10
PO #: CSI Watford

Jarda Solc
UND-Energy & Environmental
15 N. 23rd St.
Grand Forks ND 58201

Sample Description: Municipal Well
Sample Site: Watford City

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Biochemical Oxygen Demand	< 2	mg/l	2	SM 5210-B	7 Dec 06 13:30	Matt
Total Organic Carbon	4.6	mg/l	0.5	SM5310-C	11 Dec 06 8:30	Wayne
Sulfate	517	mg/l	5.00	EPA 375.4	12 Dec 06 15:31	Morgan
Nitrate-Nitrite as N	< 0.1	mg/l	0.10	353.2	13 Dec 06 9:00	Morgan
Ammonia-Nitrogen as N	0.61	mg/l	0.10	EPA 350.1	15 Dec 06 10:00	Morgan
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	11 Dec 06 12:00	Morgan
Chemical Oxygen Demand	14.9	mg/l	1.0	HACH 8000	8 Dec 06 8:30	Wayne
Iron - Total	1.50	mg/l	0.10	6010	21 Dec 06 9:12	Stacy
Manganese - Total	0.10	mg/l	0.05	6010	21 Dec 06 9:12	Stacy
Iron - Dissolved	1.38	mg/l	0.10	6010	14 Dec 06 9:41	Stacy
Manganese - Dissolved	0.10	mg/l	0.05	6010	14 Dec 06 9:41	Stacy

Approved by: C Canup

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
: = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267 ND # ND-00016

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Report Date: 22 Dec 06
Lab Number: 06-W5637
Work Order #: 82-2656
Account #: 007033
Date Sampled: 6 Dec 06 10:15
Date Received: 7 Dec 06 8:10
PO #: CSI Watford

Jarda Solc
UND-Energy & Environmental
15 N. 23rd St.
Grand Forks ND 58201

Sample Description: MW-11
Sample Site: Watford City

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Biochemical Oxygen Demand	60.0	mg/l	2	SM 5210-B	7 Dec 06 13:30	Matt
Total Organic Carbon	162	mg/l	0.5	SM5310-C	11 Dec 06 8:30	Wayne
Sulfate	5800	mg/l	5.00	EPA 375.4	12 Dec 06 15:31	Morgan
Nitrate-Nitrite as N	0.10	mg/l	0.10	353.2	13 Dec 06 9:00	Morgan
Ammonia-Nitrogen as N	1.40	mg/l	0.10	EPA 350.1	15 Dec 06 10:00	Morgan
Phosphorus as P - Total	0.53	mg/l	0.10	EPA 365.1	11 Dec 06 12:00	Morgan
Chemical Oxygen Demand	458	mg/l	1.0	HACH 8000	8 Dec 06 8:30	Wayne
Iron - Total	30.0	mg/l	0.10	6010	21 Dec 06 9:12	Stacy
Manganese - Total	2.21	mg/l	0.05	6010	21 Dec 06 9:12	Stacy
Iron - Dissolved	2.60	mg/l	0.10	6010	14 Dec 06 9:41	Stacy
Manganese - Dissolved	2.00	mg/l	0.05	6010	14 Dec 06 9:41	Stacy

Approved by: C Cantell

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
: = Due to sample quantity
= Due to sample concentration
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CERTIFICATION: MN LAB # 038-999-267 ND # ND-00016

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Report Date: 22 Dec 06
Lab Number: 06-W5638
Work Order #: 82-2656
Account #: 007033
Date Sampled: 6 Dec 06 9:30
Date Received: 7 Dec 06 8:10
PO #: CSI Watford

Jarda Solc
UND-Energy & Environmental
15 N. 23rd St.
Grand Forks ND 58201

Sample Description: MW-13
Sample Site: Watford City

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Biochemical Oxygen Demand	120	mg/l	2	SM 5210-B	7 Dec 06 13:30	Matt
Total Organic Carbon	55.0	mg/l	0.5	SM5310-C	11 Dec 06 8:30	Wayne
Sulfate	124	mg/l	5.00	EPA 375.4	12 Dec 06 15:31	Morgan
Nitrate-Nitrite as N	0.11	mg/l	0.10	353.2	13 Dec 06 9:00	Morgan
Ammonia-Nitrogen as N	0.22	mg/l	0.10	EPA 350.1	15 Dec 06 10:00	Morgan
Phosphorus as P - Total	0.59	mg/l	0.10	EPA 365.1	11 Dec 06 12:00	Morgan
Chemical Oxygen Demand	270	mg/l	1.0	HACH 8000	8 Dec 06 8:30	Wayne
Iron - Total	13.0	mg/l	0.10	6010	21 Dec 06 9:12	Stacy
Manganese - Total	0.76	mg/l	0.05	6010	21 Dec 06 9:12	Stacy
Iron - Dissolved	< 1	mg/l	0.10	6010	14 Dec 06 9:41	Stacy
Manganese - Dissolved	< 0.5	mg/l	0.05	6010	14 Dec 06 9:41	Stacy

Approved by: C. Carroll

RL = Method Reporting Limit

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CERTIFICATION: MN LAB # 038-999-267 ND # ND-00016

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Report Date: 22 Dec 06
Lab Number: 06-W5639
Work Order #: 82-2656
Account #: 007033
Date Sampled: 6 Dec 06 12:00
Date Received: 7 Dec 06 8:10
PO #: CSI Watford

Jarda Solc
UND-Energy & Environmental
15 N. 23rd St.
Grand Forks ND 58201

Sample Description: Rec-1
Sample Site: Watford City

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Biochemical Oxygen Demand	45.7	mg/l	2	SM 5210-B	7 Dec 06 13:30	Matt
Total Organic Carbon	144	mg/l	0.5	SM5310-C	11 Dec 06 8:30	Wayne
Sulfate	7100	mg/l	5.00	EPA 375.4	12 Dec 06 15:31	Morgan
Nitrate-Nitrite as N	< 0.1	mg/l	0.10	353.2	13 Dec 06 9:00	Morgan
Ammonia-Nitrogen as N	1.06	mg/l	0.10	EPA 350.1	15 Dec 06 10:00	Morgan
Phosphorus as P - Total	0.38	mg/l	0.10	EPA 365.1	11 Dec 06 12:00	Morgan
Chemical Oxygen Demand	437	mg/l	1.0	HACH 8000	8 Dec 06 8:30	Wayne
Iron - Total	16.5	mg/l	0.10	6010	21 Dec 06 9:12	Stacy
Manganese - Total	1.63	mg/l	0.05	6010	21 Dec 06 9:12	Stacy
Iron - Dissolved	2.10	mg/l	0.10	6010	14 Dec 06 9:41	Stacy
Manganese - Dissolved	1.80	mg/l	0.05	6010	14 Dec 06 9:41	Stacy

Approved by: C Carroll

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267 ND # ND-00016